

# AMERICAN VETERINARY REVIEW.

DECEMBER, 1910.

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## EDITORIAL.

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### EUROPEAN CHRONICLES.

PARIS, October 15, 1910.

**SURGICAL TREATMENT OF ROARING.**—Since our good friend and esteemed collaborator, Prof. W. L. Williams, has made a visit to England on his way to "The Hague" Congress, the question of what is the best method to follow to relieve roaring has been agitated, principally in England, where we hear that Prof. Hobday has performed Williams' operation and has improved it in numerous instances. The celebrated veteran of French veterinary surgery, Prof. Cadiot, has come out after a ten years' silence on the subject, and in one of the numbers of the *Recueil*, that of July 15th, there is published a magistral lecture that he delivered to his students on the subjects of Arytenoidectomy and Arytenoidopexy, in which he passed a review on the subject, referring to the successes obtained and recorded with Arytenoidectomy, by such men as Moeller, Siedamgrotzky, Lancilloti, Lebel, Plotz, Vennerholen, Bang, Sand, Hendricks, and many others; he concludes that the proof is well established, but nevertheless unsuccessful attempts must not be ignored. Prof. Cadiot then reviews other various methods and states that arytenoidectomy has been completed by the removal of the internal wall of the laryngeal ventricle, which has the advantage of increasing the laryngeal canal in all its height. He said a

word only of the attempts that were made of suturing the recurrent nerve to the pneumogastric, and arrived at the consideration of arytenoidopexy alluding to the method of Merillat.

The method of Prof. Williams was also carefully examined, the *modus operandi* described, and the advantages that it seems to possess dwelt upon. The results, so far, he says, are not positive; but if they confirm the facts that are already related, if they prove the efficacy of arytenoidopexy, it will certainly be a wonderful progress, which will deserve the preference when compared with arytenoidectomy, as it will be the less offensive interference.

It is well indeed for Prof. Cadiot to hold such an opinion. Advocate of an operation which has given such great results, proved so successful in many instances, he does not hesitate to acknowledge the superiority of another method, if proved by experience. In the meanwhile, he is working, he is operating and it is certain that one day, possibly far away as time only will tell the permanent efficacy of the operation, then we will have *statistics* which will decide the question beyond the possibility of doubt. I am following the tests and will be glad to present them to our readers when they are ready for publication. But we must not forget that Prof. Hobday is also hard at work. The cases that he and his assistants have operated are already counted by hundreds. But an indiscreet rumor has reached me. Prof. Hobday has had the idea of adding something to Williams' operation. If the removal of the lining of one of the laryngeal ventricles may result in enlarging the diameter of the larynx and immobilize the arytenoid cartilage, by the cicatrization, why not remove the lining of both ventricles?

If I am not mistaken that is what he is doing now; with what results time will tell. I think Cadiot has tried it also before this.

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The *Veterinary Record* of September 17th has from the pen of J. J. O'Connor, M.R.C.V.S., an article on a new method of

operating for roaring that I would do an injustice to if I did not relate it in this chronicle. Here is the *modus operandi*:

"Proceed as usual until the thyroid cartilage is reached, have the divided muscles retracted with retractors, push portion of the crico-thyroid muscle aside with the handle of the bistoury. In the angle between the anterior and inferior borders (taking the neck to be vertical) of the thyroid wing, remove by means of a trephine one-half inch in diameter, a disc of cartilage, thus exposing the thyro-arytenoid muscle immediately to the inside of the vocal cord, with the mucous membrane of the ventricle protruding between the two bellies of the muscle. Grasp the mucous membrane with a forceps, and by means of the handle of the bistoury, isolate it as far as possible from the surrounding tissues. Incise it anteriorly immediately behind the cartilage in the aryteno-epiglottic fold of membrane, thus opening into the larynx, and continue the incision all round the periphery of the exposed piece of membrane and thereby remove the greater part of the ventricular lining, including that towards the inner aspect of the vocal cord. A small portion of the membrane still lines the anterior portion of the ventricle. This can be easily grasped with the forceps, drawn through the trephine opening, cut at its fixed border and removed."

The advantages that Mr. O'Connor claims for this method are: 1. The ventricle is more directly reached; 2. There is no speculum or dilator required to be inserted into the larynx and possibly injure its lining; 3. There is no danger of wounding the interior of the larynx with the knife or other instrument in the hands of an inexperienced or nervous operator or in the case of a sudden movement of the animal should he not be profoundly anesthetized; 4. The wounds of the laryngeal opening and snipping of the ventricle are practically one and the same; 5. The cicatrization of the internal wound must necessarily draw the vocal cords outwards and thus the desired effect; 6. The thyro-arytenoid muscle always coming into view, it can at once be seen whether it has undergone atrophy and whether the case is one of true roaring; 7. The operation performed practically outside the

larynx and there is less danger of inspiration of foreign material through the laryngeal opening afterwards, being protected by the sterno-thyro-hyoid muscle which partly covers it.

In the presence of so many apparent advantages, Mr. O'Connor recognizes as apparent disadvantages: 1. The possibility of excessive granulations forming round the edges of the opening of the cartilage. But there seems to be no reason why this should occur then any more than in a temporary tracheotomy opening or that of a sinus of the head. 2. The escape of blood from the larynx may not be so free as in the case of the crico-thyroid opening.

Mr. O'Connor has operated *only* one living horse by this method and hopes that other members of the profession may express their views regarding it. The Profession has the floor.

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MALTA FEVER.—I have already alluded to this microbial disease which affects goats in some parts of the world, principally the Island of Malta and the coasts of the Mediterranean sea; and in a previous chronicle I suggested to those desirous of information relating to it, to refer to the report of 1908 of the Bureau of Animal Industry where the question of the importation of Maltese goats in the United States was justly condemned in the sixth conclusion of the excellent report of Dr. J. H. Mohler and George H. Hart, which read: "So long as Malta fever remains so prevalent in the Island of Malta and such a large percentage of the native goats are passive carriers of the *Micrococcus Melitensis*, it will be impracticable to attempt to introduce these animals into the United States. Even if they were assuredly free from the *Micrococcus Melitensis* it is doubtful on account of climatic conditions, whether they could be profitably bred in this country, except in the extreme southern states."

The reading of two recent articles in the *Revue Veterinaire* brings out points of interest in relation to the presence of the disease in other animals than goats and to the possible contagion



from these to men. They relate two cases of the disease transmitted to men by sheep and from sheep to fowls.

Indeed if some authors have already mentioned the possibility of a natural infection of bovines by the *M. Melitensis* and of the danger to which men could be exposed by it, no cases of Malta fever in man of bovine origin has yet been positively demonstrated. Mr. Dubois, late adjunct professor to the Toulouse school, has had the opportunity to witness several cases in human beings, which were undoubtedly due to infection from diseased sheep; a positive sero-diagnosis with the *M. Melitensis* and exclusive evidences of any other mode of contamination having been obtained by agglutination. In one place where the disease prevailed among ewes, ten persons, and in another thirteen presented undoubted symptoms of Malta fever. They had consumed milk and cheese from the diseased sheep, or had been only merely in contact with diseased animals (milking or other care). The *Micrococcus* was revealed as present in the blood of some of the sick persons which gave a positive sero-diagnosis of agglutination.

Investigating a very fatal epizooty among fowls, one in which the mortality had been of 70 per cent. out of a flock of 205 head, and having affected birds of all ages and assuming either a somewhat sub-acute form lasting eight or ten days and again one which ended very rapidly by death in a few hours, Mr. Dubois found in studying the nature of the epizooty among the fowls that all attempts to obtain cultures with the liver, spleen and blood from the heart of the fowls were negative as well as inoculations to rabbits, guinea pigs and pigeons. But by resorting to the sero-reaction method of diagnosis he succeeded in obtaining a complete manifest agglutination, and as in the locality where the epizooty existed, there were ewes in which Malta fever prevailed more or less extensively, he was justified to admit that the disease was due to infection by *M. Melitensis* and that this domestic animal, the fowl, may also be a source of infection to man.

The place of Malta fever among the diseases against which sanitary measures are indicated is again well demonstrated by the cases related above.

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**CYSTOPEXY IN DOGS.**—Taken from human surgery this operation is described by adjunct Professor, Mr. L. Auger, of Lyon, as the choice treatment in cases of retroflexion of the bladder, not infrequently met in dogs where it gives rise to pseudo-perineal hernia manifestations.

This accident observed principally in male subjects is indeed characterized by the change of position of the bladder which has, by a flexion at its neck, bent itself upwards and backwards to become located under the skin of the perineum between the rectum above and the urethra and prostate below. In this position micturition is interfered with, the urine flowing in by the ureters gathers in the cavity of the bladder, which soon becomes more and more distended. As the distension takes place, the flexion of the neck becomes more severe and the time soon comes when urination is impossible and rupture of the bladder is imminent unless quick relief is given.

Generally when the veterinarian is called to attend to one of these cases, the accident has already existed two or three days, and the bladder is more or less distended. It is then that the manifestations are those of a large perineal hernia. Under the anus there is an enormous swelling, more or less stretched, fluctuating, not very painful on pressure. It is the displaced bladder. In cases where the organ is very full, the anus is pushed on one side, and the rectum is squeezed between the bladder and the pelvis. To the impossibility of micturition is added that of defecation. The diagnosis of this affection is easy to make. An exploring puncture will settle the question.

The treatment must be applied at once, viz: replace the bladder and hold it in its normal position. If by taxis, the first indication can be fulfilled easily; it is not the same for the second, and on that account the only efficacious interference is first to

put back the bladder directly and after fix it by cystopexy or suturing it to the abdominal walls.

After having first of all emptied the bladder with fine exploring trocar, and also the rectum by enemas, the various steps of laparotomy are performed, the abdomen open, the bladder is carefully pulled from its abnormal position, placed where it ought to be, and with very fine needle and silk it is sutured to the walls of the abdominal cavity. The operation is simple, but, however, it is important not to involve in the stitches the vesicle mucous membrane. They must pass only through the serous and muscular coats. The after results are insignificant, as micturition and defecation are soon again normally performed.

In his article Mr. Auger mentions three cases where he performed the operation. In two it was a perfect success with perfect recovery, the accident never returned. In the third case death took place by peritonitis, the animal having torn his dressing three days after the operation.

I do not know if others have already tried this mode of treatment, but certainly its introduction in canine surgery is an important step, which will no doubt be followed by others.

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SULPHATE OF HORDENINE.—Therapeutics has received lately a new alkaloid which is called to play an important part in gastrointestinal diseases, enteritis and dysentery; at least so says the *Presse Medicale*.

The history of its discovery is quite interesting. The residues of the radicles of malt or of germinating barley seeds, used to make beer, are employed for many purposes, and among those stands the preparation of bouillons for media of cultures in laboratories. In 1890 G. Roux observed that vibrios of cholera not only did not grow in such culture, but that they were destroyed, and from that he concluded that "such residue might serve in the treatment of various diarrhoeas, either in drinks or in enemas." This idea was studied by others and the conclusions

were that in those residues there existed an active principle, to which these therapeutic properties were due. A chemist, indeed, a few years later, in 1906, succeeded in isolating an alkaloid, the *Hordenine*, whose characters, composition and physico-chemical composition were soon made known. The physiological and the clinico-therapeutic were carried out, and to-day the results obtained are well known.

Hordenine is an alkaloid that can combine with salts and the sulphate among them is the one which seems to possess the qualities essential to permit its being used hypodermically or by the digestive tract. Its toxicity is very weak, its minima fatal dose in intravenous injections is 0 gram, 25 by kilogramme weight of the animal, for dogs, guinea pigs or rabbits.

Given in intravenous injection, it acts in therapeutic doses as a hypertensor cardio-vascular tonic. Its action upon the secretions varies according to doses and experimental conditions and on that account may be hyper or hypocrinic. In dogs, in doses of from 1 to 10 centigrammes by kilogramme, it produces nausea, vomiting and constipation by immobilization of the intestines.

To the clinical point of view, it has been extensively experimented with and proved very promising in the advantages that can be gained by its use. Its action has made it, for some, comparable to those of opium and of morphia. And although the toxicity of Hordenine is much less than that of morphia, the hypocrinic and inhibitory effect on the intestinal peristalsis is common to both as well as the tonic-cardiac action. Hordenine acts upon the diarrhoeic elements, quiets the pain, immobilizes the intestines and sometimes promotes constipation.

We believe that in some pathological condition of the intestines of dogs, Hordenine may prove quite useful to veterinary practitioners.

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STRONGYLUS DOUGLASSII OR WIRE WORMS IN THE OSTRICH.  
—The learned Director of the Veterinary Laboratory of

Grahamstown, W. Robertson, M.R.C.V.S., writes a popular article on this parasite in the *Agricultural Journal of Cape of Good Hope*, where interesting points are found for ostrich breeders and veterinarians as well.

First noticed some thirty years ago by Hon Arthur Douglass, from whom the name was given, *Strongylus Douglassii* are fre-

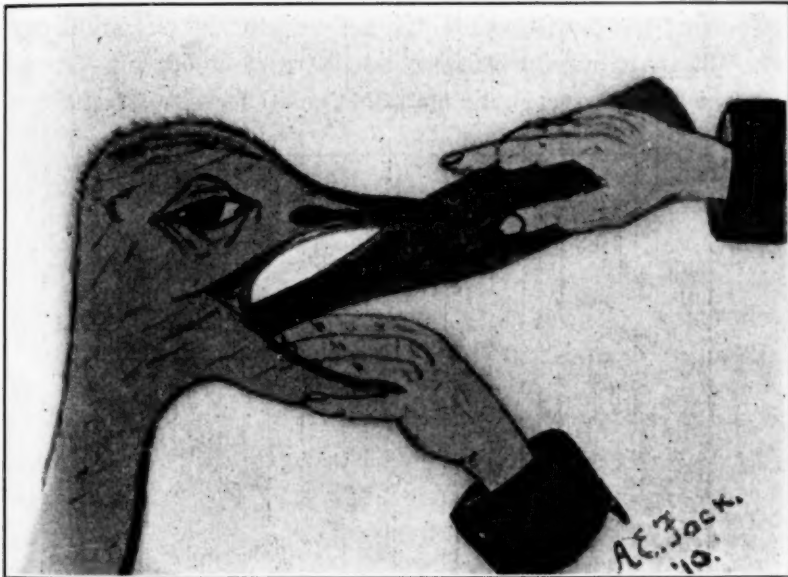


DIAGRAM SHOWING THE POSITION OF THE FINGERS OF THE LEFT HAND COVERING THE WINDPIPE WHEN DRENCHING.

—From the "Agric. Journ.," Cape Good Hope.

quent in South African birds and do a great deal of harm. As a general statement it may be said that all birds (ostriches) are infected with them and that in all degrees, although it is said that a bird under twenty days old has never been found badly infected, yet one month old chicks have been seen with their stomachs alive with the parasites.

The symptoms presented by the bird are briefly: General falling off in condition, a disappearance of the yellow sub-cutaneous fat (so noticeable in healthy well doing birds), a pallor of the pink lining of the mouth and throat, and sometimes an in-

crease in the amount of chalky deposits voided with the urine and dung. A curious feature of a bird affected is its refusal to eat meales, dry barley, or other grain.

The number of parasites that may be found is simply enormous. Estimated approximately at several millions, it is probable that 5,000 is more the correct figure. By experiments carried out, it can be safely assumed that the incubation period of the eggs of the *S. Douglassii* is between seventeen and twenty days. The treatments recommended are quite legion. Administered in drenches, carbolic acid does good for the worms, but it



HOLDING THE HEAD UP AFTER DRENCHING.

may also be the fruitful cause of injuring the feathers. Lysol has also its advocates. So has paraffine, blue stone, tar dip, formalin, lime and sal ammoniac.

The administration is comparatively a simple operation and yet it requires some attention. Tin bottles with an air hole is the best to use. Stand in front of the bird, keeping clear of the legs, have a boy to each wing and see that they grasp the root of the wing and the body well, as dislocation of the wing may re-



sult by improper holding; then seize the bird's lower jaw with the left hand, shove the first, second and third fingers over the opening of the wind pipe in the floor of the mouth, the thumb being under the lower jaw, slip the neck of the bottle over the fingers and well down the gullet, empty, and withdraw the bottle. Hold up the bird's head for a second or two as some of them have the power of inverting the beak and literally pour the medicine out. This information from Dr. Robertson is very interesting and useful and must be of great advantage to those who cannot secure veterinary service easily.

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AN IMPROVEMENT IN CHLOROFORMIZATION.—In domestic animals and principally dogs and cats, chloroform is most used to obtain general anæsthesia, and although serious modifications, care and apparatuses of all kinds have been resorted to so as to render it harmless, the operation is not without danger; even notwithstanding the subcutaneous injection of atropomorphine, there is especially with operations having a long duration, more or less danger of accidents always undesirable.

To remedy this Mr. Charmoy, Chief of Clinics at Alfort, has resorted to a modification in the technic of general chloroformization which he has borrowed from German human surgery and which has given him excellent results.

Doctor Klapp, of the clinics of Bier at Berlin, had noticed that in animals recently bled, chloroform anæsthesia was more rapid than in those that had not been bled. This being due to the fact that there was less blood to saturate with the anæsthetic to produce sleep. From this remark he concluded that if he could with his patients take off some of their blood from the action of chloroform, by applying elastic strings at the base of both thighs, he might obtain the same results as on an animal just bled. This he did with success; and besides, he observed that at the end of the operation, when the elastic compression was removed, and the

circulation re-established, the patient would wake up almost immediately without any bad after ill effects. Fresh blood not intoxicated by the chloroform thrown in the circulation caused it. In cases of syncope this could no doubt give as excellent results also. Dr. Klapp has resorted to this method of chloroformization in many operations and always arrived at the same ends: *Easier and more rapid anæsthesia and more rapid waking up afterwards.* The learned Chief of Clinics at Alfort has tried the method in cats and dogs whenever important operations required general anæsthesia, employing or rejecting the previous injection of atropomorphine. Rubber cords were applied on the hind legs above the stifle and at the same time on the fore limbs above the elbows, tightening them well high up so as to immobilize as much blood as possible. They were tightened so as to arrest the arrival of the blood in the extremities. General anæsthesia was then proceeded with in the usual manner; it took place more rapidly and as soon as the operation was ended and the rubbers made loose and removed, gradually the animal opened his eyes, moved his head and came to without any trouble. Prof. Charmoy has performed nineteen operations of importance with this improved mode of general anæsthesia (hernias, colopexy, hysteropexy, ovariectomy, enterotomy, cataract, removal of tumors and extremities), and he had only two accidents. In one, the animal had extensive lesions of the liver and in the other severe tuberculous lesions.

As an experiment on one animal, the anæsthesia was carried out to complete arrest of respiration, death was about taking place, but life soon returned by degrees and almost suddenly with the removal of the elastic ligatures from the four legs. A far better result being obtained than that which could have followed the ordinary classic method of artificial respiration and so forth.

As a possible objection (if it is one) is that infrequently a certain loss of power on the legs may follow and last a few days. But this readily subsides without treatment and is all gone after a week or so.

This is a valuable addition to the administration of general anaesthesia in our small domestic animals, where, even with the closest attention, complications may arise.

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BIBLIOGRAPHIC ITEMS: *Archives of Biological Sciences of the Imperial Institute of St. Petersburg*, Nos. 3 and 4 of Vol. XV., containing: Contribution to the Physiology of the Thyroid body, on lipasis and oxydasis of the thyroid body and its influence upon lipotitic and oxydizing process in the blood, by Dr. A. S. Jowshtchenko; Piriform Circumvolution and Smelling in Dogs, with plates, by L. V. Zavadsky; on Antirabic Vaccinations, by Dr. W. Kraiouchkine; on The Grouping of Microbes of the Streptococcus Gender, by A. J. Berdnikoff.

*Bulletin of The Louisiana State Board of Health* containing the proceedings of the Fifth Annual Health Conference, where among the many valuable contributions published is the illustrated one of Dr. Dalrymple of the State University on "Some Conditions Affecting Public Health."

*Agricultural Journal* of the Cape of Good Hope.

*Veterinary Notes* of Parke Davis and Co., September number of Vol. 3.

*Report of the Investigations* carried on at the Bacteriological Institute of Halle by our esteemed collaborator, Prof. Dr. H. Raebiger, and finally I have also just received the announcement of the New York State Veterinary College, with the report from the Director, Prof. V. A. Moore, and Pamphlet VI. from the Council on Defense of Medical Research.

And as I am closing this chronicle, there comes from Montevideo the eight first numbers of the *Revista de Medicina Veterinaria de la Escuela de Montevideo*, with our old friend, Dr. Daniel E. Salmon as Director. We send our thanks to the doctor and our welcome for the new Revue, whose success cannot be doubted with such eminent leader and its long list of worthy collaborators.

A. L.

### A. V. M. A. TO GO TO TORONTO IN 1911.

As a result of the votes cast for each of the cities that extended invitations to the American Veterinary Medical Association to meet within their gates in 1911, Toronto, Canada, has been elected. And, since the votes electing Toronto have come from a representation of the association embracing the four points of the compass and the Middle West also, it is the unquestionable *choice* of the association, and we look forward to a tremendous gathering there at the next convention of the national organization. Many of our Canadian brethren have faithfully attended our meetings in the United States, wherever we have elected to hold them, but there are undoubtedly many hundreds of others who will avail themselves of this opportunity to meet with us on their own soil that would never have come to us here, even though on this, our second trip into their country, we do not penetrate any great distance into the interior. Through a strange coincidence the gentleman who will preside at the coming meeting of the American Veterinary Medical Association on Canadian soil was elected to membership in the organization on the one other occasion when it convened in Canada. Let us hope that this coincidence will afford President Glover the opportunity to realize his expressed ambition for a thousand new members for the A. V. M. A. in 1910-11. Supporting the ambition of the chief executive of the A. V. M. A., the REVIEW renews its appeal of a year ago, to each member of the association to secure one new member. That seems very little for each member to do, and really *is* very little; and yet if they will but do it, the glorious ambition will become an accomplished fact. Who will send in the first name? Among some of the other ambitions of the president, and toward which he will direct his earnest efforts, are the raising of the standard of matriculation requirements for entrance into the veterinary schools, and the securing of uniformity of degrees in all recognized veterinary colleges of America. These efforts should have the support not only of every member of the organization, but of every

veterinarian in America. The good that would result from their accomplishment is too obvious to require argument in their favor.

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### NATIONAL HORSE SHOW.

The most brilliant event on the social or sporting calendar of the season was brought to a close in Madison Square Garden, New York, at a late hour on Saturday night, November 19th, when the National Horse Show, which had opened there on the 12th, concluded its imposing program by awarding the prizes to the championship classes. This required practically the entire day, beginning with the light harness horses in the morning, following with the saddle classes in the afternoon and finishing with the high-stepping harness horses and hunters in the evening; although one large class of hunters or jumpers was shown in the afternoon that gave those present a splendid exhibition of training and finished jumping. They jumped into a small enclosure with a high fence on four sides, continuing on and out of it over the fence at the opposite end, turning and jumping back into it, and out of it over the *side* fence without stopping; then proceeded to a four-rail fence, where the rider was required to remove the top rail with one hand, while controlling his horse with the other, rode back a few yards, returned and jumped the remaining three rails. Splendid types indeed were the horses that executed with apparent ease that difficult feat. Another exhibition of good horsemanship and good horses was the police horse drill, in which twenty-nine mounted officers went through many brilliant manœuvres without a single mistake, their mounts being trained with military exactness.

Among many encouraging features of the 1910 show was the interest shown in the breeding classes, and in horses for practical everyday purposes, such as the roadsters and draft horses, as well as the hackneys and coachers, not alone by the exhibitors, who had entered generous classes of trotters and road-



sters, including two classes of Morgans, one for mares and one for stallions, but also by the genuine interest evinced by a large percentage of the eighty thousand visitors who came in during the week to "look them over." The selection by the judges of the Austrian-bred trotting stallion "Willy," 2.07 $\frac{3}{4}$ , as the best horse of his type in the show, will no doubt be a great stimulus to the breeders of trotters and roadsters in America to present one next year to eclipse him.

Two such horse shows as have been conducted by the National Horse Show Association of America in New York in 1909 and 1910 are surely encouraging to the horse interests of the country, and we can look forward to a continuance of them, better on each succeeding occasion, under the efficient directorship of its officers. The veterinary representation attached to the judges' staff were Drs. J. E. Ryder, New York City; William Sheppard, Sheepshead Bay, N. Y., and E. R. Voorhees, Somerville, N. J.

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THE following from the *Breeder's Gazette* of November 23 indicates that the horse is also the center of attraction in Chicago's society, and making a hit:

"Horse-lovers who have flocked to Chicago are enjoying the best horse show ever seen in the West, if not in America. The recent show ring experiences of some noted winners at last week's New York show have, if possible, improved their performance here. Every class is well filled and hotly contested by the horses, while the friendly rivalry of exhibitors prompts the keenest efforts to win. The show is a beautiful, entertaining and instructive presentation of the extreme quality of type and performance that has been attained by harness and saddle horses. The International of Chicago has undoubtedly gained strength since last year. The large showing of saddle horses and ponies in various classes is an especially gratifying evidence of the growing interest of American breeders in these useful pleasure types which must always be in demand. Interest in the classes for army officers is at high tension, both because of their distinctly international flavor and for the novel character of the events." \* \* \*



## ORIGINAL ARTICLES.

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### OPEN AIR EXPERIMENTS WITH TUBERCULOUS CATTLE.\*

BY J. G. RUTHERFORD, OTTAWA, CANADA.

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In the year 1905 a herd of cattle on one of the outlying experimental farms situated in Nova Scotia were found, on being tested, to be badly affected with tuberculosis.

All clinical cases having been slaughtered, the survivors were at my request kept under open air conditions from December, 1905, until May, 1906, when they were removed to Ottawa and placed in a secluded pasture to which outside cattle had no access.

Here also they were kept under open air conditions, their only shelter being a frame shed one board thick, wind and weather proof above and on three sides, but on the fourth open to a large yard where they were fed in winter, but from which they were at liberty to wander at will. Except when undergoing test, they watered themselves at running streams on one of which a drinking place was always kept open in winter. The pasture, which consisted of some two hundred acres of rough land, abounded in natural shelter, the shed itself being situated in a grove of evergreen trees which afforded considerable protection from the keen winds of winter.

Their food consisted of grass in summer and in winter of good sound hay. A small grain ration was occasionally given for a short period to such of the older animals as appeared to require it, but these cases were very few, the majority keeping in good condition at all times, although naturally running down in flesh in the late summer and early fall, the seasons being

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\*Presented in connection with Report of Committee on Diseases, A. V. M. A., San Francisco, Cal., September, 1910.

through the whole experiment abnormally dry. Salt was kept constantly within reach.

On arrival at the station the herd numbered forty three (43) head, twenty-eight (28) being pronounced reactors. Of these latter twenty-one (21) were females of dairy blood, comprising pure bred and grade Ayrshires, Holsteins and Guernseys ranging in age from one to eleven years. One was a pure bred Ayrshire bull two years old, and the other six (6) were yearling steers, one being a Hereford grade and the others grade Shorthorns.

Of the non-reacting animals two (2) were yearling heifers of Ayrshire blood, seven (7) were yearling Shorthorn grade steers, and five (5) were calves of various dairy breeds.

The objects which I had in view in commencing the experiment, which was of a purely practical character, were three in number:

(1) To ascertain the effects of the open air treatment on the diseased cattle themselves.

(2) To ascertain to what extent healthy cattle kept in contact with diseased cattle were subject to infection.

(3) To ascertain what percentage of healthy calves it is possible to rear without any precautions from diseased cows kept under open air conditions.

In the light of experience I am now convinced that in so far as the securing of definite information on these three points was concerned, this original herd should have been maintained intact and without additions throughout the whole course of the experiment.

As will be shown, however, this was not done and the results of the work are accordingly less exact and proportionately less valuable from the breeder's point of view, although possibly more interesting to the professional man than they otherwise would have been.

The alterations which took place in the herd were as follows: One two-year-old heifer (non-reactor) and one bull calf died of black quarter shortly after arrival at the station. An eight-year-

old cow (reactor) died of broncho-pneumonia after being mired in the creek for some time in freezing weather.

These losses as also some which occurred later among animals born on the station were, although regrettable, only such as might occur under any circumstances. I may say that after the occurrence of the black quarter cases, all the young stock was kept carefully vaccinated, and further, that no more cows got fast in the creek.

For the other changes, some of which I now think were mistakes, I assume full responsibility.

In July, 1906, some few weeks after their arrival at the station the six reacting steers already mentioned were slaughtered under supervision. They were fat, and as we had numerous reactors capable of breeding and therefore more valuable, I grudged the grass they were eating, and decided to let them go.

Of the six reacting steers the carcase of one only was condemned, tubercular lesions being found in the post-pharyngeal glands and in the bronchial and mediastinal glands, as also a large abscess containing several pints of semi-fluid foetid pus involving the liver and the right kidney.

Although tuberculosis was found in each of the four others, it was of the slightest character. The sixth was apparently free from disease.

We may let them go from this paper as they went from the experiment, as their history is of little value, except in so far as it corroborates very strikingly the theory that the incipient case of tuberculosis gives the highest reaction to tuberculin. They were only yearlings on arrival at the station, yet their highest temperatures, when tested the previous year in Nova Scotia were respectively,  $107.6^{\circ}$ ,  $106^{\circ}$ ,  $106^{\circ}$ ,  $108.2^{\circ}$ ,  $106^{\circ}$ ,  $105^{\circ}$ .

In the fall of 1907 the seven steers which were rated as healthy on arrival, having been subsequently tested several times without reaction, were slaughtered, no evidence of tubercular infection being discovered in any of these.

These steers should undoubtedly have been kept in contact with the diseased cattle until the close of the experiment, but as

we had a number of other non-reactors, and these were of no value for breeding purposes, while the herd from natural increase and other additions numbered at this time over seventy-five (75) head, I was reluctantly compelled to let them go.

The outside animals added to the herd were of two kinds:

Owing to a lack of foresight on the part of those in charge of the cattle in Nova Scotia, during the latter part of the first winter the bull was permitted to run with the cows, most of which had not been bred during the previous season. As a natural result our calves began to arrive in November, most of them coming in December when the weather was intensely cold. Fearing that under open air conditions the loss would be considerable, I arranged for a supply of young calves from outside sources, and on such of the cows as were heavy milkers I put an extra calf. This also was an error from the point of view of exactitude in results, but although, as will be seen later, a greater percentage of these animals than of those born on the station, proved to be tubercular, I am not inclined to the belief that any of them were affected on arrival, as none of them were more than a few days old.

The other additions, however, comprised both diseased and healthy animals. Thirteen (13) mature reactors and one reacting yearling, mostly pure bred animals of the dairy breeds, were introduced from time to time, while four non-reacting yearlings were also added.

Seven of these outside reactors were on arrival well marked clinical cases, and as several subsequently broke down with what was evidently a most virulent form of the disease I am inclined to think that they were responsible for the infection of some of the young stock and possibly for the re-infection of a number of the older animals which had ceased to react and were apparently on the road to recovery.

Their introduction was therefore another mistake, but as from several of them we were able to derive valuable information we need spend no time in vain regrets.

In all 350 tests were made during the course of the experiments, 259 of which were on reactors and the remainder on animals which with one exception, No. 4-A, to which special reference will be made later, were so far as it was possible to judge, free from tuberculosis.

Of the 350 tests above mentioned, 161 were made in such a way as to ensure the detection of any abnormally early reaction, and it is interesting to note that although in 119 of these cases the animals tested were reactors and in twenty-one (21) the period between the tests was less than three months, there were only seven (7) instances in which it might have been possible to miss the highest reading by beginning to take post injection temperatures at the tenth hour as was the usual practice until the announcement made by Professor Vallee, a few years ago, led us to look for earlier reactions, especially in animals which had been previously tested within a short period.

As this is rather interesting, I will give the details of these cases as follows:

No.	Name.	No. of test.	Period since last test.	Date of test.	Distinct rise.	Highest temp.	Normal temp.
4	Sarah.....	7th	11 mos.	Sept., 1908	2d hr.	8th hr.	10th hr.
6	Mamie.....	4th	8 mos.	May, 1907	4th hr.	4th hr.	7th hr.
13	Polly.....	8th	3 mos.	Feb., 1909	6th hr.	8th hr.	20th hr.
15B	Lydia's calf (adopted)....	2d	11 mos.	Sept., 1908	2d hr.	2d hr.	8th hr.
18a	Bonnie Lass's heifer calf.....	2d	3½ mos.	Nov., 1907	4th hr.	8th hr.	10th hr.
30	Guernsey heifer....	5th	11 mos.	Sept., 1908	4th hr.	8th hr.	16th hr.
68	Denty Girl.....	4th	11 mos.	Sept., 1908	2d hr.	8th hr.	10th hr.
86a	Illuminata 3d's calf	3d	3 mos.	Feb., 1909	2d hr.	24th hr.	26th hr.

It is noteworthy that none of these early reactions occurred in the twenty-one (21) cases in which the last previous test had been made less than three months before, and that, in fact, most of them occurred in animals which had not been tested for nearly a year.

The eighth test in this table (92-93 Illuminata 3d's calf) is only listed with the others as showing one of the eccentricities of temperature which may be encountered when using tuberculin.

Having now laid before you a general outline of the experiment I propose to run as rapidly as possible over its details, first dealing with each animal separately and concluding with a brief summary of the results obtained.

The information to be derived from these is perhaps of minor value being decidedly negative in character, but as we and some others much more distinguished have reason to know, it is not well to be at any time too positive in regard to bovine tuberculosis.

In order to economize your time and patience, I propose on this occasion to give only the results of each test and not the various temperatures. The tests were of various kinds. Those of May and October, 1905, September, 1906, July and October, 1907, and February 18th, 1909, were conducted in the ordinary way by injecting at night and commencing to take temperatures at or about the tenth hour thereafter.

On the other hand in that of May, 1907, the taking of temperatures was begun at the fourth hour after injection and continued every third hour until the seventeenth hour, while in those of September and November, 1908, the first temperature was taken two hours after injection, subsequent temperatures being taken every second hour until the twenty-fourth hour.

That of February 21st to 27th, 1909, was a special test in which only a few of the survivors were dealt with. In this test a large number of preliminary temperatures were taken, the animals injected at 3.30 p. m. on the 25th and temperatures taken at the third hour and continued for over twenty-four hours.

In the cases of some of the added cattle, dates other than those just mentioned will be noticed. These tests which were not made at the station were all of the usual nature.

Koch's tuberculin was used, and while the doses were graded to suit the different ages of the animals, they were never any larger than would have been administered in an ordinary official test. It was unfortunate that the animals had to be tied up when being tested, as this was an interference with their usual habit of life, but every precaution was taken to prevent their becoming



annoyed or excited, and I do not think that in any one case the results of the test were affected from this cause.

At the conclusion of the experiment all the animals then alive, except those which had been clearly shown to be healthy by repeated tests and isolated accordingly, were killed. Most of them were buried on the premises, but those whose condition warranted such a course, were slaughtered under careful inspection for use as food.

#### ORIGINAL HERD.

The age given is that of the animal at the time of slaughter or at the close of the experiment.

No. 1. *Maggie*.—Grade Ayrshire cow, 7 years.

Never showed clinical evidence of tuberculosis.

(Ceased Reactor.)

Reacted May, 1905; October, 1905; September, 1906;  
May, 1907.

Tested without reaction October, 1907; September, 1908.  
Slaughtered October 20, 1908.

Autopsy.—Small tubercular nodule left lung; caseated purulent lesions, posterior mediastinal glands.

Progeny.—(1a) Bull calf born February, 1907, always healthy and thrifty.

Tested without reaction October, 1907, September, 1908.  
Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis.

No. 2. *Winnie*.—Grade Guernsey cow, 7 years.

Never showed clinical evidence of tuberculosis.

Reacted May, 1905; October, 1905.

Tested without reaction, September, 1906; May, 1907;  
October, 1907.

Reacted September, 1908; November, 1908.

Slaughtered November 19, 1908.

Autopsy.—Tubercular lesions both lungs, some encysted, others recent; purulent tubercular nodules size pigeon's egg in peritoneum; small encysted and calcified lesions in posterior mediastinal and mesenteric glands.

Progeny.—

(2a) Bull calf, born January, 1907 (cryptorchid).

Not tested.

Slaughtered June, 1907.

Autopsy.—No evidence of tuberculosis.

(2b) Bull calf born April, 1908; always healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Slaughtered April 26, 1909.

Autopsy.—No evidence of tuberculosis.

No. 3. *Yellow Kate*.—Imported pure bred Ayrshire cow, 9 years.

Animal lost flesh rapidly winter of 1906-7, when she nursed two calves; afterwards improved, but never again became fat, although showing no clinical evidence of tuberculosis.

Reacted May, 1905; October, 1905; September, 1906.

Tested without reaction May, 1907; October, 1907.

Reacted September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Tubercular lesions left lung; some purulent, others encysted; calcified lesions anterior and posterior mediastinal glands; many small calcareous encysted nodules in mesenteric glands.

Progeny.—

(3a) Heifer calf born December, 1906, healthy and thrifty.

Tested without reaction July, 1907; September, 1908; February, 1909.

Has since remained healthy.

- (3b) Bull calf adopted December, 1906.  
Healthy and thrifty.  
Tested without reaction October, 1907.  
Reacted September, 1908; November, 1908; February, 1909.  
Slaughtered March 6, 1909.  
Autopsy.—Left post pharyngeal gland tubercular, caseous. No other lesions.
- (3c) Bull calf adopted December, 1906.  
Died October, 1907, of diarrhoea.  
Autopsy.—Very small tubercular lesions in one post pharyngeal gland.
- (3d) Bull calf born May, 1908, healthy and thrifty.  
Reacted September, 1908.  
Slaughtered October 21, 1908.  
Autopsy.—Tubercular lesions posterior mediastinal glands.

No. 4. *Sarah*.—Pure bred Ayrshire cow 3 years.

Never showed clinical evidence of tuberculosis.

Reacted May, 1905.

Tested without reaction October, 1905; September, 1906; May, 1907.

Doubtful reaction July, 1907; October, 1907.

Reacted September, 1908.

Tested without reaction November, 1908.

Slaughtered November 19, 1908.

Autopsy.—No evidence of tuberculosis.

Progeny.—(4a) Heifer calf born December, 1906, healthy and thrifty, no evidence of tuberculosis.

Tested without reaction July, 1907; May, 1908; November, 1908; February, 1909.

(See note.)

Slaughtered February 19, 1909.

Autopsy.—Right lung contained six purulent cavities, each as large as an egg; tubercular process involving

visceral, diaphragmatic and costal pleural surfaces, right side of thorax; anterior and posterior mediastinal glands also tubercular.

No. 5. *Norah*.—Pure bred Ayrshire cow, 6 years.

Never showed clinical symptoms of tuberculosis.

(Ceased Reactor.)

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907;

October, 1907; September, 1908; November, 1908.

Slaughtered November 19, 1908.

Autopsy.—No lesions of tuberculosis detected.

Progeny.—

(5a) Bull calf at foot on arrival at station, always healthy and thrifty.

Tested without reaction September, 1906.

Has since remained healthy.

(5b) Bull calf born January, 1907, healthy and thrifty.

Tested without reaction July, 1907; May, 1908; November, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis detected.

(5c) Bull calf born April, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 6. *Mamie*.—Pure bred Ayrshire cow 5 years.

Never showed clinical evidence of tuberculosis.

Reacted May, 1905; October, 1905; September, 1906; May, 1907.

Tested without reaction October, 1907.

Reacted September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Small encysted tubercular nodules anterior and posterior mediastinal glands. Caseous and encysted nodules in cervical lymphatic glands.

## Progeny.—

(6a) Heifer calf (twin) born December, 1906, always healthy and thrifty.

Tested without reaction July, 1907; November, 1907; May, 1908; November, 1908; February, 1909.

Slaughtered April 26, 1909.

Autopsy.—No evidence of tuberculosis.

(6b) Bull calf (twin) born December, 1906, healthy and thrifty.

Tested without reaction July, 1907; November, 1907; May, 1908.

Slaughtered Dec. 21, 1908.

Autopsy.—No evidence of tuberculosis.

(6c) Heifer calf born April, 1908, healthy and thrifty.

Reacted September, 1908.

Slaughtered October 21, 1908.

Autopsy.—No evidence of tuberculosis.

No. 7. *Beatrice*.—Pure bred Ayrshire cow, 8 years.

Showed no clinical evidence of tuberculosis.

Reacted October, 1905; September, 1906.

Died January, 1907, from broncho-pneumonia, contracted through being mired in creek.

Autopsy.—Small encysted tubercular lesions in peri-bronchial, anterior and posterior mediastinal glands.

Progeny.—(7a) Heifer calf born December, 1906, healthy and thrifty.

Tested without reaction July, 1907; November, 1907; May, 1908; November, 1908.

Has since remained healthy.

No. 8. *Minnie*.—Pure bred Ayrshire cow 5 years.

Never showed clinical evidence of tuberculosis.

(Ceased Reactor.)

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907;  
October, 1907; September, 1908.

Slaughtered October 20, 1908.

Autopsy.—Slight encysted lesion in left lung. Encysted lesions in mesenteric gland.

Progeny.—

(8a) Heifer calf born November, 1906, healthy and thrifty.

Tested without reaction July, 1907.

Doubtful reaction November, 1907.

Reacted September, 1908.

Doubtful reaction November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Traces of previous peritonitis; no positive evidence of tuberculosis found in spite of careful examination.

(8b) Bull calf adopted November, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908.

Has since remained healthy.

(8c) Bull calf born June, 1908.

Died from navel infection June 30, 1908.

Autopsy.—No evidence of tuberculosis.

No. 9. *Sonsy*.—Pure bred Ayrshire cow 12½ years.

Tuberculosis of the udder detected on arrival at station. The following year showed clinical symptoms.

(Clinical.)

Reacted May, 1905; October, 1905; September, 1906.

Tested without reaction May, 1907.

Doubtful reaction July, 1907.

Slaughtered September 27, 1907.

Autopsy.—Generalized tuberculosis, pharyngeal glands caseated, left hind quarter udder caseated, also entire mesen-



teric chain bronchial and mediastinal glands and pericardium affected. Tubercular deposit on pleural surfaces, both lungs adherent to costal pleura; portal glands affected, tubercular deposit on peritoneum, liver and one kidney.

Progeny.—

(9a) Heifer calf born 1905; arrived at station at foot, healthy and thrifty.

Tested without reaction September, 1906; December, 1906; May, 1908.

Has since remained healthy.

(9b) Bull calf born February, 1907. Did not thrive and although apparently healthy at birth and for some time afterwards, failed to develop and was noticed to cough occasionally—remained thin.

Tested without reaction July, 1907.

Reacted October, 1907.

Slaughtered October 10, 1907.

Autopsy.—Few nodules on lung surfaces, mediastinal and bronchial glands slightly affected.

No. 10. *Guernsey Heifer*.—4½ years.

While showing no definite symptoms, remained thin and unthrifty. Gave birth to two calves, one premature and one stillborn.

Reacted October, 1905; September, 1906; May, 1907; October, 1907; September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Open tubercular lesions, caseat purulent in lungs; similar lesions in liver; intestinal ulcer, grape formation on costal pleura, nodules on diaphragm and spleen; lymph glands encysted; purulent lesions in post pharyngeal; purulent and encysted lesions in peribronchial, purulent broken down lesions in anterior and posterior mediastinal; encysted lesions in the periportal glands. Caseous lesions

generally distributed throughout the mesenteric glands and encysted lesions in the trunk lymphatic glands.

Progeny.—(10a) Bull calf adopted January, 1907, healthy and thrifty.

Tested without reaction October, 1907; September, 1908. Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis.

No. 11. *Grade Ayrshire Heifer "A."*—Four years.

Exhibited clinical symptoms almost immediately after arrival at station, which continued to develop, although occasional temporary improvement was noticeable. Finally became greatly emaciated. Before slaughter she exhibited distressed breathing, was hide bound and suffered from diarrhoea. Gave birth to premature calf soon after arrival and reared one adopted one. She was also the dam of another (No. 22), which arrived at station when 6 months old. As will be noted, the adopted calf was tested three times, reacting to the two last tests.

(Clinical.)

Reacted October, 1905; September, 1906.

Tested without reaction May, 1907.

Slaughtered June 10, 1907.

Autopsy.—Generalized tuberculosis. Extensive lesions in lungs, breaking down, pus escaping from bronchial tubes. Tubercular deposits in retropharyngeal, anterior, posterior bronchial and mesenteric also sub-lumbar lymphatic glands.

Progeny (See No. 22).—(11a). Bull calf adopted September, 1906. No clinical symptoms, but unthrifty.

Tested without reaction May 1907.

Reacted October, 1907; September, 1908.

Slaughtered October 20, 1908.

Autopsy.—Caseated and calcified tubercular lesions, right lung; encysted and calcified lesions in peribronchial and in anterior mediastinal glands.

No. 12. *Ayrshire Heifer "B."*

Never showed clinical evidence of tuberculosis.

Reacted October 1905; September, 1906.

Tested without reaction May, 1907.

Doubtful reaction October, 1907.

Reacted September, 1908; November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Tubercular lesions at base of each lung; tissue involved in both being size of man's fist, and having direct connection with bronchi. Small lesions in anterior and posterior mediastinal glands.

Progeny.—

(12a) Bull calf arrived at station at foot, healthy and thrifty.

Tested without reaction September, 1906; December, 1906; May, 1907.

Has since remained healthy.

(12b) Bull calf born April, 1908, healthy and thrifty.

Tested without reaction September, 1908.

Reacted February, 1909.

Slaughtered February 19, 1909.

Autopsy.—Small calcified tubercular lesions in right posterior pharyngeal lymphatic gland; posterior mediastinal glands hemorrhagic; no other lesions.

No. 13. *Polly*.—Grade cow 5 years.

Never showed evidence of tuberculosis.

Reacted May, 1905; October, 1905; September, 1906.

Tested without reaction May, 1907; October, 1907.

Reacted September, 1908; November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Tubercular lesions on pleura, taken for chronic tubercular pleurisy. Some sub-pleural tubercular nodules. No other lesions.

Progeny.—

(13a) Bull calf born December, 1906, healthy and thrifty. Tested without reaction October, 1907; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis.

(13b) Bull calf adopted December, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis.

(13c) Heifer calf born May, 1908, appeared healthy and thrifty.

Reacted September, 1908; February, 1909.

Slaughtered February 19, 1909.

Autopsy.—Very small calcified tubercular lesions in posterior mediastinal glands. No other evidence of tuberculosis.

No. 14. *Jessie*.—Grade Ayrshire, 5 years.

No clinical evidence of tuberculosis.

(Ceased reactor.)

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907; October, 1907; September, 1908; November, 1908.

Slaughtered November 19, 1908.

Autopsy.—Small purulent nodules (tubercular) partially encysted inferior lobe left lung, also small nodule in posterior mediastinal glands.

## Progeny.—

(14a). Heifer calf born January, 1907; healthy and thrifty.

Tested without reaction October, 1907; September, 1908; February, 1909.

Has since remained healthy.

(14b) Heifer calf born May, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 15. *Lydia Rooker*.—Pure bred Holstein cow 7 years.

Showed no symptoms of disease although for some time suspected of udder tuberculosis. Owing to this suspicion her milk was repeatedly subjected to microscopical examination, without result, so far as the detection of tubercule bacilli was concerned.

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907; October, 1907; September, 1908; November, 1908.

Reacted February, 1909.

Slaughtered March 6, 1909.

Autopsy.—No evidence of tubercular infection.

## Progeny.—

(15a) Heifer calf born January, 1907, healthy and thrifty.

Tested without reaction October, 1907.

Doubtful reaction September, 1908.

Reacted February, 1909.

Slaughtered February 19, 1909.

Autopsy.—No evidence of tuberculosis.

(15b) Steer calf adopted January, 1907. Did not thrive very well, but remained apparently healthy.

(Adopted.)

Doubtful reaction October, 1907; September, 1908.  
Tested without reaction November, 1908; February,  
1909.  
Slaughtered March 6, 1909.  
Autopsy.—Calcified tubercular lesions in posterior mediastinal glands.

No. 16. *Rex's Maud*.—Pure bred Guernsey cow 13 years.

Showed no symptoms of disease save an occasional cough. At times run down in condition, but not more than might reasonably be expected in an aged animal kept previously under artificial conditions.

(Clinical.)

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907;  
October 1907.

Doubtful reaction September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Tubercular lesions at base of both lungs; in the right caseous and purulent; in the left purulent opening direct into a bronchial tube through which pus was escaping. This pus proved infective to a guinea pig, proving the animal to have been a source of danger to others. Adhesions present on the costal pleuræ; caseated and encysted nodules in anterior and posterior mediastinal glands. Caseous and encysted nodules in periportal glands; numerous calcareous encysted nodules in the mesenteric glands and caseated nodules in the thoracic trunk glands.

Progeny.—

(16a) Heifer calf born February, 1907, healthy and thrifty.

Tested without reaction October, 1907.

Reacted September, 1908.

Slaughtered October 20, 1908.



Autopsy.—Small tubercular lesions along posterior border left lung; few tubercular nodules in the anterior mediastinal gland.

(16b) Bull calf born May, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 17. *Curly*.—Grade Guernsey cow 7 years.

Always in excellent condition; never showed any evidence of tuberculosis.

Reacted October, 1905; September, 1906.

Doubtful reaction May, 1907.

Slaughtered June 20, 1907.

Autopsy.—Generalized tuberculosis, both lungs full of tubercular lesions; extensive adhesions both sides of thoracic cavity; tubercular lesions in the retropharyngeal, prepectoral, anterior and posterior mediastinal, bronchial mesenteric and inguinal glands; stenosis of the os-uteri.

Progeny.—None.

No. 18. *Bonny Lass*.—Pure bred Ayrshire cow 4 years.

Showed no symptoms of disease; always in good condition.

Reacted October, 1905; September, 1906.

Tested without reaction May, 1907; October, 1907.

Reacted September, 1908.

Tested without reaction November, 1908.

Slaughtered November 19, 1908.

Autopsy.—Extensive caseous and purulent lesions in both lungs with direct communication to the bronchial tubes; caseous and encysted lesions in the peribronchial anterior and posterior mediastinal and encysted and calcified lesions in mesenteric glands.

Progeny.—

(18a) Heifer calf born November, 1906, healthy and thrifty.

Tested without reaction July, 1907.

Reacted November, 1907; September, 1908.

Slaughtered November 13, 1908.

Autopsy.—Limited number of solitary tubercles about size of millet seed in apex of right lung. Tuberculous nature of these confirmed by microscopic examination; inflammatory changes in posterior mediastinal glands, but no definite tubercle formation. These changes were shown to be tubercular by microscopic examination.

(18b) Heifer calf born April, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 19. *Holstein Heifer "B."*—Four years.

Kept in good condition; showed no evidences of tuberculosis.

(Ceased Reactor.)

Reacted May 1905; October, 1905; September, 1906.

Tested without reaction May, 1907; October, 1907; September, 1908.

Slaughtered October 22, 1908.

Autopsy.—Areas of tubercular infection omentum; calcified lesions in peribronchial anterior and posterior mediastinal glands; small tubercular area, anterior portion left lung. Open.

Progeny.—(19a) Bull calf born November, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tubercular infection.

No. 20. *Holstein Cow "A."*—Four and one-half years.

Always in good condition; never showed clinical evidence of tuberculosis.

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906.

Reacted May, 1907; September, 1908.

Slaughtered October 21, 1908.

Autopsy.—Tubercular lesions in peribronchial and posterior mediastinal glands; caseous, some undergoing calcification.

Progeny.—(20a) Heifer calf, born December, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908; February, 1909.

Has since remained healthy.

No. 22. *Ayrshire Grade Heifer*, calf of No. 11.—Three and one-half years.

Never showed clinical evidence of tuberculosis.

Tested without reaction September, 1906; May, 1907; October, 1907; September, 1908.

Reacted February, 1909.

Slaughtered February 19, 1909.

Autopsy.—Tubercular lesions evidently of recent origin found on posterior mediastinal and peribronchial glands.

Gave birth to two calves, both of which died at birth or immediately after. In these a careful post-mortem examination failed to reveal evidence of tuberculosis.

No. 28. *Togo*.—Pure bred Ayrshire bull, 4½ years.

Developed well, remained thrifty, no clinical evidences of tuberculosis.

Reacted October, 1905; September, 1906; May, 1907; October, 1907; September 1908.

Slaughtered October 21, 1908.

Autopsy.—Calcified tubercular lesions in anterior and posterior mediastinal glands. No other lesions detected.

No. 29. *Holstein Cow*.—Four years.

Never showed clinical evidences of tuberculosis.

Reacted May, 1905.

Tested without reaction October, 1905 (high preliminary temp.) ; September, 1906; May, 1907; October, 1907.  
Reacted September, 1908.

Slaughtered October 22, 1908.

Autopsy.—Small ulcerated area and small nodule on omentum. Also small nodule on liver. Microscopical examination of these lesions failed to reveal presence of tuberculosis.

Progeny.—(29a) Heifer calf born April, 1907, healthy and thrifty.

Tested without reaction October, 1907.

Doubtful reaction September, 1908.

Slaughtered Nov. 13, 1908.

Autopsy.—No evidence of tuberculosis detected.

No. 30. *Guernsey Grade Cow*.—Four years.

Condition of this animal varied considerably; showed no clinical symptoms of tuberculosis, but was never fat.

Reacted October, 1905.

Tested without reaction September, 1906.

Reacted May, 1907; October, 1907; September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Tubercular lesions present in liver appearing as small excrescences of an active type on its external surface while the body of the organ contained a tubercular mass 5 inches in diameter. Excrescences on peritoneum, nodules in lymph glands; encysted lesions in posterior mediastinal and periportal glands; encysted and purulent lesions in some of the mesenteric and encysted lesions in the abdominal trunk glands.

Progeny.—

(30a) Heifer calf, born January, 1907. Remained apparently healthy until February 13, 1907, when it was attacked with diarrhœa, which, however,

yielded to treatment in about eight days. Few days later became dull, elevated temperature, cough at intervals. Cough gradually became more frequent, respirations more rapid; nasal discharge. Gradually became worse and died March 11, 1907.

Autopsy.—Tubercular lesions right lung; also in thymus gland which was full of miliary tubercles; few tubercles also in parenchyma of spleen.

(30b) Heifer calf born April, 1908, healthy and thrifty. Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 31. *Ayrshire Cow*.—Four years.

Never showed clinical evidence of tuberculosis.

Tested without reaction October, 1905; September, 1906; May, 1907; October, 1907; September, 1908; February, 1909.

Has since remained healthy.

Progeny.—(31a). Bull calf born June, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

This disposes of the original herd. The following animals are those which, as has already been stated, were introduced to the herd from time to time during the course of the experiment.

No. 45. *Bloomer*.—Pure bred Ayrshire cow.

Arrived station June, 1906; never showed clinical evidences of tuberculosis.

Reacted November, 1905.

Doubtful reaction December, 1905.

Tested without reaction April, 1906; September, 1906; May, 1907.

Reacted October, 1907; September, 1908.

Slaughtered November, 1908.

Autopsy.—Tubercular lesions left lung, with area undergoing caseation, with communication to bronchial tubes. Caseating lesions anterior and posterior mediastinal, mesenteric and lymphatic glands.

Progeny.—(45a) Heifer calf born June, 1907, healthy and thrifty.

Reacted September, 1908.

Slaughtered October 20, 1908.

Autopsy.—Purulent lesions left post-pharyngeal gland.

No other lesions detected.

No. 46. *Maggie II.*—Pure bred Ayrshire cow.

Arrived station June, 1906; in poor condition, wild excitable and vicious. Later became quiet and improved in condition.

Reacted November, 1905.

Tested without reaction December, 1905; April, 1906;

September, 1906; May, 1907; October 1907.

Reacted September 1908.

Slaughtered October 21, 1908.

Autopsy.—Tubercular lesions base of right lung; caseating, purulent, encysted; apparently an open case.

Progeny.—(46a). Heifer calf born April, 1907, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 65. *Canada Regens.*—Pure bred French Canadian cow.—Four and one-half years.

Arrived at station December, 1906; apparently healthy except for persistent cough.

Reacted September, 1906.

Doubtful reaction May, 1907.

Reacted October, 1907.

Reacted September, 1908.



Slaughtered October 21, 1908.

Autopsy.—Lesions tubercular in mesenteric glands. One lesion size of ostrich egg, involving a single gland and causing obliteration of the entire glandular structure. External portion of this mass was calcified; in the center a cavity about the size of a hen's egg containing a serous exudate. No other lesions.

No. 66. *Legacy*.—Pure Ayrshire cow, 5 years.

Animal arrived at station December, 1906, in fair condition, but never laid on flesh.

Reacted December, 1906.

Tested without reaction May, 1907; October, 1907.

Reacted September 1908.

Slaughtered October 18, 1908.

Autopsy.—Limited encysted tubercular lesions right lung. Caseated nodules in anterior mediastinal, posterior mediastinal and peribronchial glands; encysted nodules in peribronchial and few caseated nodules in mesenteric glands.

Progeny.—

(66a) Heifer calf, adopted December, 1907, healthy and thrifty.

Reacted October, 1907; September, 1908.

Tested without reaction November, 1908; February, 1909.

Slaughtered March 7, 1909.

Autopsy.—Caseated and calcified tubercular lesions in anterior mediastinal glands. No other indications of tuberculosis detected.

(66b) Bull calf born April, 1908, healthy and thrifty.

Tested without reaction, September, 1908.

Slaughtered October 22, 1908.

Autopsy.—No evidence of tubercular infection.

No. 67. *Maggie III.*—Pure bred Ayrshire cow 3 years.

Arrived at station December, 1906. Unthrifty but no clinical evidence of tuberculosis.

(Ceased Reactor.)

Reacted December, 1906.

Tested without reaction May, 1907; October, 1907; September, 1908; November, 1908.

Slaughtered November 19, 1908.

Autopsy.—No evidence of tuberculosis detected.

Progeny.—(67a) Bull calf born June, 1908.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 68. *Denty Girl.*—Pure bred Ayrshire cow 5 years.

Arrived at station December, 1906, in fair condition, but with persistent cough.

Reacted December, 1906.

Tested without reaction May, 1907; October, 1907.

Reacted September, 1908.

Slaughtered October 18, 1908.

Autopsy.—No lesions of tuberculosis found in thoracic or abdominal cavities. Left popliteal gland caseated and purulent. Tubercular bacilli were found in pus and proved infective on a guinea pig inoculated therewith.

Progeny.—

(68a) Heifer calf adopted, transferred from Beatrice No. 7, January, 1907, on the death of that animal. healthy and thrifty.

Reacted October, 1907; September, 1908.

Tested without reaction November, 1908.

Reacted February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Caseous tubercular lesions post pharyngeal glands. Caseous and calcified lesions in periportal gland. Calcified lesions in posterior mediastinal gland and in peribronchial glands.

(68b) Heifer calf born January, 1907, healthy and thrifty.

Tested without reaction July, 1907; November, 1907.  
Has since remained healthy.

(68c) Bull calf born April, 1908, healthy and thrifty.

Reacted September, 1908; February, 1909.

Slaughtered February 19, 1909.

Autopsy.—One calcified tubercular nodule size of pigeon's egg, right posterior mediastinal gland.

No. 78. *Jersey Grade Cow*.—Eight years.

Arrived at station January, 1907, in fair condition, but with persistent cough. Gradually lost flesh, cough becoming more troublesome accompanied by nasal discharge.

Reacted May, 1907; July, 1907; October, 1907.

Died July 31, 1908.

Autopsy.—Inflammatory peritoneal adhesions; kidneys enlarged and congested with hemorrhages in the parenchymatous portions; abdominal lymphatic glands, including mesenteric and periportal, involved in tubercular lesions, which were of two kinds; some wholly encysted and walled off from remaining glandular tissue; others recently formed, scarcely visible to the naked eye, with hemorrhages, apparently resulting from tuberculous septi-cemia. Fallopian tubes presented very advanced tubercular condition, the giant cells having been destroyed and each field of the microscope showing a mass of tubercle bacilli.

Progeny.—(78a) Bull calf born July 1907, healthy and thrifty.

Reacted September, 1908; November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Left postpharyngeal gland purulent and calcified.

No. 82. *Count Cedric*.—Pure bred Shorthorn bull, 2½ years.

Arrived at station July 4, 1907. Condition varied considerably; during fall of 1907 became emaciated, refused food; persistent high temperature; later improved, but never regained perfectly healthy appearance.

Reacted November, 1908; May, 1907; October, 1907; September, 1908.

Slaughtered October 22, 1908.

Autopsy.—Tubercular lesions in postpharyngeal, anterior and middle cervical glands, which were completely broken down and contained in each instance large quantity purulent material. Caseated lesions in anterior mediastinal gland. Carcass greatly emaciated.

No. 84. *Flossie's Gem*.—Pure Guernsey cow 4 years.

Arrived at station May, 1907; showed no clinical evidence of tuberculosis.

Reacted May, 1907.

Tested without reaction October, 1907.

Doubtful reaction September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Slight pleuritic adhesions not definitely tubercular. Tubercular nodules omentum, purulent tubercular lesions in postpharyngeal glands.

Progeny.—(84a). Heifer calf born October, 1907, healthy and thrifty.

Reacted September, 1908.

Slaughtered October 31, 1908.

Autopsy.—No evidence of tubercular infection.

No. 85. *Ottawa Fortune*.—Pure bred French Canadian heifer 3 years.

Arrived at station May, 1907; unthrifty persistent cough, rapid breathing.

Reacted May, 1907.

Doubtful reaction October, 1907.

Slaughtered October 10, 1907.

Autopsy.—Tubercular lesions well marked, lungs badly affected, about one-quarter caseated, covered with nodules in grape formation. Much pleuritic adhesion; portal, mesenteric and lymphatic glands badly affected. Large nodules on liver.

No. 86. *Illuminata* 3d.—Pure bred Shorthorn heifer 3 years.

Arrived at station May, 1907; unthrifty, but no definite symptoms of disease.

Reacted May, 1907; highest temperature 10 hours after injection, 107.6, with pronounced clinical disturbance.

(See Note.)

Tested without reaction October, 1907.

Slaughtered November 25, 1907.

Autopsy.—No evidence of tubercular infection.

Progeny.—(86a) Bull calf born July, 1907; unthrifty but no clinical symptoms.

Doubtful reaction September, 1908.

Tested without reaction November, 1908.

Doubtful reaction February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Slight pleuritic adhesion, which could not be considered as positive evidence of tuberculosis. Subsequent pathological investigation failed to give any confirmatory data.

No. 98. *Flora*.—Pure bred French Canadian cow 5 years.

Arrived at station May, 1908. Never showed clinical evidence of tuberculosis.

Reacted May, 1908.

Doubtful reaction September, 1908; November, 1908.

Slaughtered November 19, 1908.

Autopsy.—Few localized lesions (tubercular), evidently recent and active in both lungs. Purulent lesions large and small beneath peritoneum at border of omentum, near attachment to stomach. Twenty of these tubercular abscesses, each containing thick, creamy pus. No other lesions detected.

Progeny.—(98a) Heifer calf born May, 1908, more or less unthrifty.

Reacted September, 1908; November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—No evidence of tubercular infection.

No. 99. *Grey Grade Steer*.—One year.

Arrived at station May, 1908. No evidence of tuberculosis.

Tested without reaction May, 1908; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tubercular infection.

No. 100. *Red Steer*.—One year.

Arrived at station May, 1908. No evidence of tuberculosis.

Tested without reaction May, 1908; September, 1908.

Slaughtered December, 21, 1908.

Autopsy.—No evidence of tubercular infection.

No. 101. *Guernsey Bull*.—Pure bred, 1 year.

Arrived at station September, 1908; showed no evidence of tuberculosis.

Reacted May, 1908; June, 1908.

Doubtful reaction August, 1908.

Reacted September, 1908.

Slaughtered October 31, 1908.

Autopsy.—Tubercular lesions undergoing caseation at base of both lungs; tubercular lesions in peribronchial glands.



No. 102. *Red Grade Heifer Calf.*

Arrived at station November, 1907, apparently healthy; no clinical evidence of tuberculosis.

Tested without reaction November, 1907; September, 1908.

Reacted February, 1909.

Slaughtered February 19, 1909.

Autopsy.—Tubercular lesions in anterior and posterior mediastinal glands; tubercular area about size of egg in right lung, containing caseated and calcified nodules, with direct discharge into bronchial tubes.

No. 103. *Jersey Cow.*—Pure bred 5 years.

Arrived station September, 1907, in fair condition, but persistent cough.

Reacted October, 1907.

Slaughtered October 10, 1907.

Autopsy.—Tubercular lesions well marked; portions of lung tissue solidified. Large areas caseated; numerous cavities containing pus; tuberculous nodules, liver and pleura and in portal and mesenteric glands.

A reference to the list will show that cows Nos. 1, 5, 8, 14, 19 and 67 are classed as "Ceased Reactors." The post-mortem findings in these cases will be found especially interesting.

Three other cases (Nos. 9, 11 and 16) classed as "Clinical," also ceased to react, apparently owing to the disease having become generalized.

Eleven animals (Nos. 4, 5, 6c, 8a, 15, 15a, 29a, 67, 84a, 86 and 98a) reacted but failed on post-mortem examination to show any evidence of tuberculosis. Such cases are, as is well known, not at all uncommon. They furnish no argument against the reliability of tuberculin, but rather the opposite, occurring as they do in animals in which the disease is either of very recent origin or in which the lesions are so small or so deeply seated in unusual locations as to render their detection a matter

of great difficulty. A striking instance of the last-mentioned condition is furnished by No. 68, in which the disease was confined to one popliteal gland.

The history of No. 86, although short, is very interesting and instructive. The pronounced reaction shown by this animal in May, 1907, would appear to indicate that the infection in her case was recent and very slight, while her subsequent record suggests the possibility of the progress of the disease having been at least temporarily arrested.

Of the two animals which died of tuberculosis, namely Nos. 30a and 78, one was a calf of two months in which the disease was probably congenital; the other, an aged Jersey cow, had reacted three times, the last test being ten months before death.

Special attention is directed to No. 4a, which, on being slaughtered on February 19, 1909, when over two years old, was found to be badly affected with tuberculosis, although it had never shown any evidence of disease and had been tested four times without reaction, the periods elapsing between the tests being ten, six and three months respectively.

This case is both interesting and instructive, showing as it does that an animal, while still retaining externally the appearance of health, may within a comparatively short period, become affected to such an extent as to nullify the action of tuberculin. Giving this heifer the benefit of the full period of incubation possible, as stated by our best authorities, namely, fifty days, the disease must, to all appearance, have been contracted not more than five months before the last test to which, as has been shown, there was no reaction.

Among the most noteworthy cases may be mentioned No. 17, an animal which was always fat, and which was expected to make excellent beef, but whose carcass was condemned for generalized tuberculosis. In view of the actual conditions revealed by the post mortem, the doubtful reaction obtained from this animal a month before slaughter is particularly interesting.

The individual record of No. 22 is also instructive, especially when the history of her dam, No. 11, is taken into consideration.

The exceedingly well marked reactions given by No. 28, "Togo," at each time of testing are noteworthy, in view of the comparatively slight lesions found on post mortem.

Perhaps the most striking feature of the whole experiment is the fact that sixteen mature animals (Nos. 2, 3, 4, 6, 12, 13, 15, 18, 20, 29, 30, 45, 46, 66, 68, 84) which positively reacted in from one to four tests, became ceased reactors, but subsequently reacted again. In two of these animals the autopsy failed to reveal any evidence of tuberculosis, while in another the results were doubtful.

All the thirteen others were found to be diseased, although the degree of infection varied very greatly.

Special attention is directed to the post-mortem findings in No. 68. The diseased popliteal gland which was the only evidence of tuberculosis found would scarcely have been detected in the ordinary abattoir inspection and might easily have been missed in even a reasonably thorough post-mortem examination.

The fact that a number of these animals failed to react to the same tests, and that their subsequent reactions also occurred simultaneously may suggest to some minds the possibility of these apparent eccentricities being due to a variation in the tuberculin used or to some other peculiar condition affecting the test.

It must be remembered, however, that not only did several mature animals, among which may be specially mentioned Nos. 10, 28, 65 and 82, reacted regularly to the tests to which these others failed to respond, but that many other animals, as will be seen from their individual records, also reacted to one or more of these tests.

Exclusive of those born dead, of which there were several, and those which died from causes other than tuberculosis, the number of calves entering into the experiment was fifty-two (52). Of these forty (40) belonged to the original herd, thirty-three (33) being progeny and seven (7) adopted, while of the remaining twelve (12) two (2) were adopted, and ten (10) the offspring of the cows subsequently introduced.

Of these, twenty-nine (29), comprising twenty-five (25) of the original herd, and four (4) from the added stock, escaped infection; twenty-one (21) contracted tuberculosis, and two (2) (Nos. 29a and 86a) were suspicious, having given doubtful reactions, but no evidence of disease on post-mortem examination.

No. 4a gave ample evidence of infection on post mortem, without having at any time reacted, while Nos. 6c, 8a, 15a, 84a and 98a reacted positively, but gave no post-mortem proof of infection.

Giving one of the two (2) doubtfuls to each gives us approximately 60 per cent. of healthy calves as against 40 per cent. infected.

Of the calves both of the original herd, twenty-two (22) escaped infection, ten (10) became diseased, and one (1) remained doubtful, the proportion of healthy calves in this lot being therefore about 66 per cent., a showing somewhat worse than was anticipated, when in September, 1908, the experiment being then unfinished, I stated that twenty-five per cent. (25 per cent.) of the calves of these particular cows were likely to prove diseased.

Of the adopted calves three (3) only remained healthy, while six proved to be infected, thus exactly reversing the percentage given above in the case of the calves born of the original herd.

Of the calves born of the cows brought to the station subsequent to the arrival of the original herd, four (4) only escaped infection, while five (5) became diseased, and one (1) was classed as doubtful. The percentage of diseased animals in this case was also much larger than in the original herd, a result which is not surprising, when the large number of advanced clinical cases of tuberculosis among the dams is taken into account.

Of the calves, seventeen (17) in all, which remained healthy and alive at the close of the experiment, three (3) were born in 1905; five (5) in 1906; three (3) in 1907 and six (6) in 1908.

Of the thirteen (13) which failed to react, and were found healthy on slaughter, six (6) were over two years old, five (5) were over one year, and two (2) were six months old.

Summarizing the results of the experiment, on the lines laid down at its inception, it will be seen that, even under the limitations attributable to the removals and additions which were unfortunately permitted, these results are not entirely valueless.

So far as the effects of open air treatment on the animals themselves are concerned, it may be noted that among the members of the original herd, five (5), namely, Nos. 1, 5, 8, 14 and 19, ceased to react; that in one of these, No. 5, the post-mortem examination revealed no evidence of disease, while in No. 8 the slight lesions found were all encysted. The conditions in Nos. 1 and 14 were less satisfactory, while that of No. 19 was decidedly discouraging.

Among the added cows will be found another, No. 67, which, entering the herd in December, 1906, also became a ceased reactor, and in her case the autopsy failed to reveal the existence of disease.

As has already been stated, eleven (11) cows of the original herd and five (5) of those added later also became ceased reactors, but afterwards began again to react. The fact that in three of these, Nos. 4, 15, and 29, no satisfactory evidence of tuberculosis was found on post mortem, suggests a recent reinfection. Whether or not the recrudescence of the disease which had apparently taken place in all the others of this lot, was due, as I have already suggested, to reinfection from the very virulent clinical cases introduced from outside, can only remain a matter of conjecture.

During the three years that the experiment was in progress, only one animal of the original herd, namely No. 11, actually broke down. This case showed clinical symptoms almost immediately after arrival and only lived a little over a year. She might, therefore, almost be classed with a number of the later arrivals which really came to the station only to die and were never considered as being of any experimental value.

Judging from the conditions found on post mortem a number of the other members of the original herd would, very shortly, have become active clinical cases.

The evidence on the whole leads to the conclusion that open air treatment is not likely to exercise any marked curative influence on animals already tuberculous, especially when reinfection is possible through cohabitation with clinical cases.

So far as concerns the securing of information regarding the extent to which healthy cattle kept in contact with diseased cattle are subject to infection, the experiment has proven of but little value. Had the seven healthy steers slaughtered in the fall of 1907, been allowed to remain with the herd throughout the whole experiment, the results would have been more interesting and valuable. It is true that they lived for over two years in close contact with tuberculous cattle without becoming infected. On the other hand, as most of the infection and reinfection, if such took place, apparently occurred during the year 1908, the fact that their slaughter took place when it did was very regrettable.

Of the other healthy animals, No. 31, a member of the original herd, was between October, 1905, and February, 1909, tested six times without reaction, and has since remained healthy, as has also her one calf; on the other hand, No. 22, which also came with the herd, after passing four tests without reaction, gave a positive reaction in February, 1909, and on post mortem showed very clear evidence of recent tubercular infection.

Nos. 99 and 100, which entered the herd in May, 1908, and which were twice tested without reaction, showed on slaughter in December, 1908, no evidence of tubercular infection.

No. 102, however, which entered the herd in November, 1907, and which also underwent two tests without reaction, reacted positively in February, 1909, and when slaughtered showed distinct evidence of tubercular infection.

A careful scrutiny of the individual records of the calves reared on the station will reveal a very few cases which might indicate that infection possibly took place after weaning. Most



of the calves, however, which became diseased, reacted at such an age as to indicate that they derived the infection direct from their dams.

In view of all the circumstances the evidence derived from this experiment, as to the likelihood of animals becoming infected under open air conditions, is of no great value.

The proportion of healthy calves raised from the whole herd, namely 60 per cent., is at first sight somewhat discouraging, but when it is remembered that, with one exception, No. 31, all the cows on which they were reared were affected with tuberculosis, that one had a tuberculous udder and that a number of the others were open and clinical cases, the matter assumes a somewhat different aspect. It is, I think, highly improbable that such a large percentage of healthy calves could have been obtained from a herd of the same kind under ordinary stable conditions.

In conclusion, I would say that while the results derived from this experiment are on the whole somewhat disappointing, they are not without value, inasmuch as they furnish a good deal of useful information regarding the eccentricities of bovine tuberculosis, as well as on the use of tuberculin for diagnostic purposes.

In this connection I would add that although I have not thought it advisable to burden this paper with the temperatures taken at each test, these figures are all available, and whether or not they are eventually published, it will give me much pleasure to furnish them to any one specially interested in this phase of the subject.

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DR. W. H. DALRYMPLE, of the chair of veterinary science at the State University, has received a certificate of membership in the Author's Club, London, England. Dr. Dalrymple was recently admitted as a member of this organization in the list of "over seas" members. The fact that Dr. Dalrymple is a native of Scotland and frequently visits the British Isles, makes this membership of especial significance to him while in London. It was founded by Sir Walter Besant, and its General Council is composed of men well-known throughout the United Kingdom.

—*New Orleans Times-Democrat.*

## NUCLEIN.\*

BY HERBERT F. PALMER, B.S., D.V.S., CHICAGO, ILL.

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Someone has said that Nuclein is one of nature's antitoxins. To this Dr. John Fearn, one of California's medical men, has added: "These antitoxins, of which we know many, and I think we shall know yet more, have in all probability existed from the very beginning of man's physical life. They have been in us and of us, but we did not know of them; it has taken the patient and continuous research of scientists of the nineteenth and twentieth centuries to reveal their presence to us. And yet we know comparatively little about them. An all-wise and beneficent Creator has provided an inner guard for the protection of life and health; these guards, for convenience, we will call phagocytes. It is the business of these guards to surround these bacteria and to destroy them. The business of destruction, for convenience, we will call phagocytosis. Now this fight is going on all the time in man's body. If bacteria are on top, then there is sickness, specific disease and trouble. If the phagocytes are on top, then there is health and freedom from disease."

Nuclein seems to possess both a chemical and physiological action. Physiologically, nucleins are said to form the chief constituents of the living cells, or in other words, nuclein is that constituent of the cell by virtue of which the histological unit grows, develops and reproduces itself. It is the function of the nuclein of the cell to utilize the pabulum within its reach. In reality the number of kinds of nuclein is limited only by the number of kinds of cells.

Chemically, it is the basis of that part of the cell designated as the nucleus, being a complex proteid body characterized especially by the large amount of phosphorus which it contains.

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\* Presented at the forty-seventh annual convention of the American Veterinary Medical Association, San Francisco, Cal., September, 1910.

The phosphorus exists in the form of nucleinic acid, which is combined with a highly complex basic substance. So far as is known the nucleinic acid of all nucleins is the same, but the basic part may and does differ in the various nucleins. The amount of nucleinic acid present is determined by the percentage of phosphorus freed from sulphur. This normally amounts to about 9.4 per cent. in the wheat product.

The veterinarian's interest in nuclein centers around the primary fact that the white corpuscles of the blood normally constitute the most important and probably the most numerous nucleated cells daily undergoing destructive changes.

To Miescher belongs the honor of first studying nucleins deliberately, and it was he who gave them the name. Nuclein is a comparatively new product, it being as late as 1874 that Miescher made his most important contribution to the knowledge of nucleins, while the names of our own countrymen, Vaughan, Novy and McClintock are intimately connected with all advances made in this line.

Right here let us depart a little and offer a tribute to those who are to-day on the active stage. Little can we realize how recent are the great advances made in veterinary medicine until we come to know that those men, whose names are so intimately associated with its advance, are to-day still upon the active stage. Metchnikoff, Vaughan, Novy and McClintock, all names of men now familiar in the study of nuclein, are to-day carrying on their great work.

Inasmuch as nuclein may be obtained from many kinds of cells, vegetable and animal both, its commercial preparation has brought into the field many sources of supply. In the earlier days Hoppe-Seyler prepared nuclein from yeast, Lubarin from casein, Plosz from blood corpuscles of birds, and Miescher from yolk of eggs. To-day, on a commercial basis, two sources are principally employed, one being yeast, the other the germ of wheat.

Nuclein, as derived from the germinating portion of the wheat kernel, encounters many difficulties in its manufacture,

but the high quality of the product justifies the extra expense involved. As thus produced it is absolutely uniform in strength, being standardized to a phosphorus-content of one milligramme to each cubic centimeter of nuclein solution.

I have thus tried to tell you what nuclein is and about its method of manufacture. The points now of interest are: What will nuclein do? and why use it in veterinary practice?

Nuclein is given to increase the defensive power of the blood against disease germs. In order to appreciate the "how" of the nuclein action it will be necessary to go back a little and explain the theory of Metchnikoff, which first led to its general use. Metchnikoff is to-day one of the workers at the Pasteur Institute of Paris, France, and, although better known to most people on account of his researches in connection with the lactic-acid ferments, it was he who gave us the theory of phagocytosis. To Pasteur, Metchnikoff, V. Behring and Koch belong the honor of first evolving a theory of immunity; Pasteur with his exhaustion or chemical theory and Metchnikoff with that of phagocytosis.

Similar to action of the amœbæ Metchnikoff noticed that leukocytes throw out arm-like processes which surround the bacterium, and he claimed that they virtually digest it. The leukocytes were found to be closely allied to the amœbæ. In noting their action he soon saw that their work was not confined to bacteria alone, but that organized and unorganized particles of various kinds fell prey to the leukocytes. They attack and may devour any invading organisms which they may meet, and thus rid the body of parasites. When they have thus taken care of all of the bacteria which have gained a footing in the body, the disease necessarily comes to an end. The defense of the animal economy, according to this theory, is entrusted entirely to phagocytosis and especially the leukocytes.

Some five years previous to the presentation of Metchnikoff's theory, Koch pointed out that leukocytes may develop bacteria and carry them to the regional lymph glands where the leukocytes themselves perish and the bacteria are deposited. The

latter do not necessarily suffer and may eventually be carried along the lymph stream and cause metastatic processes. If this occurred to any extent, leukocytosis might be a process to be feared rather than encouraged.

If a bacterium enters the tissues these cells may at once make their way to the site of the infection and proceed to ingest the bacteria and kill them intracellularly. In this way the animal recovers with or without transient illness.

The assemblage of leukocytes which takes place at any focus of irritation is almost certainly protective in character, and it has also been shown by Kantrack and others that the granules contained in the protoplasm of the leukocytes consist of substances which tend to combat the bacteria and stop their growth. Leukocytes carry away the products of inflammation and at times they may engulf the germs themselves. If the bacteria are too strong for the tissue defense, they continue to increase and multiply. More and more tissue is destroyed and increasing numbers of leukocytes gather to the spot and are killed. These dead leukocytes and the tissue liquefied by the bacterial enzymes constitute the abscess. This liquefaction of tissue proceeds from the center toward the surface and may go on until the surface is reached and the tissue detritus (pus) and the bacteria are together discharged from the body.

Leukocytes are attracted in large numbers into the area in which bacteria are situated. Leukocytes are always attracted where there is a slight injury, a hemorrhage, the presence of a poison, of a foreign body of any sort, or any dead or useless tissue. There can be no doubt that their function is protective. This is nature's way of overcoming the trouble, the leukocytes acting as natural scavengers. Under suitable conditions any phagocyte can ingest any abnormal body of suitable size and remove it to the nearest lymph gland.

Metchnikoff's theory was several steps in advance, in the claim that leukocytes became, as it were, educated or trained in their work in overcoming the bacterium, thus having greater



power to deal with it in future attacks. This educational method, he contended, made it possible for a great number of bacteria to be overcome and disease thus checked or warded off. In some cases, of course, the outcome of struggle may not be favorable to the animal, as the leukocytes may be repelled or killed by bacterial poisons, and hence insufficient phagocytosis occurs. We may thus say, as a general statement, that any animal is susceptible to a bacterial disease only when the leukocytes are unable to antagonize the bacteria successfully and in this miniature life and death struggle the bacteria win out.

The life of a leukocyte is a short one and is measured in days only. They do not propagate themselves, but are emitted from bone marrow, run their life course or are overcome by disease and die. Observations seem to show that leukocytes in excess of normal, produced as a result of the injection of certain substances such as nuclein, are deficient in activity. On the contrary Rosenau has shown that leukocytes in excess of normal produced as a result of infection, *e. g.*, leukocytes from cases of pneumonia, have greater phagocytic power than those of healthy persons. While to Metchnikoff really is due the credit for the discovery of phagocytosis and its bearing upon immunity, other and later workers have made many important discoveries concerning it. The phagocytic theory of immunity is now accepted only as modified by the humoral theory, in which it is claimed that certain substances in the fluids of the body constitute the important factor in opposing the invasion of bacteria; these substances have been given the name of alexins or protective substances.

Later came Ehrlich's side-chain theory of immunity, which virtually incorporated both the phagocytic and the humoral theories. This has been still further modified by Wright's opsonic theory, which really incorporates not only all of Ehrlich's theory, but also much of the chemical theory of Pasteur. Thus we now accept a theory built up by Pasteur, Metchnikoff, Ehrlich and Wright. Its growth has been an evolution of short duration, but mighty advancement. But be the cause of immunity what



it may, certain it is that Metchnikoff gave us a theory that forms a logical working basis for the action of nuclein.

Since leukocytosis was so important for the combating of infection, the conclusion was obvious that an increased leukocytosis must assist the organism more effectively, and attempts were made to produce this artificially by stimulating substances. It may be said in passing that the old-fashioned application of heat, vesicants, etc., all produced a hyperleukocytosis.

The first attempt to antagonize infections by inducing hyperleukocytosis is credited to Surgeon Santa Salieri, who was probably the first to attempt to increase the resistance of the peritoneum to infection. He gave endoperitoneal injections of a small amount of physiological salt solution by which the resistance of the peritoneum to bacillus coli infection was increased from seven to sixteen times.

We have thus dwelt at length on the theory of leukocytosis, as advanced by Metchnikoff, in order to demonstrate clearly the reasons for the administration of nuclein. Of one thing, all who have observed nuclein will agree: it increases the number of the white corpuscles of the blood, aiding phagocytosis, thus assisting nature to overcome disease. As Dr. V. C. Vaughan, of the University of Michigan, has said: "The polynuclear white blood-corpuscles are active agents in preventing or retarding the multiplication of pathogenic germs within the body." It is thus rational therapy to give an agent which will increase these substances. "This increase in the polynuclear corpuscles," said Vaughan, "may be produced by introducing into the animal the most distinctive constituent of these cells, which is nuclein."

Among some of the early demonstrators, Mikulicz-Radecki demonstrated that injections of 5 per cent. neutralized nucleinic acid increased the power of resistance of the peritoneum to forty times the normal. Miyake about the same time demonstrated that the intraperitoneal injection of a one-half of one per cent. solution of nucleinic acid was the most satisfactory. The effect

of nucleinic acid was so marked that the animal was able to resist twenty times the normal minimum lethal dose of bacillus coli.

Regarding the length of time which this leukocytosis lasts, Diez and Campora gave intraperitoneal injections as well as subcutaneous injections and found the leukocytosis to last about seventy-two hours.

In one series of cases in the human, one-half grain of nuclein was given every four days. In three hours the leukocytosis increased from 17,000 to 25,000, and was found to persist for twelve to forty hours.

Dr. Vaughan demonstrated that the effect of nuclein was transient and in order to secure any real benefit from its use nuclein must be administered repeatedly and at comparatively short intervals. We would naturally expect this result owing to the very short life period of leukocytes.

A few years ago quite remarkable results were obtained in the treatment of contagious abortion by local injections of yeast. The ration of the cure was not then fully understood. Since the nuclein theory has been evolved and so much commercial nuclein is made from yeast, it would not be surprising to assume that it was simply a phagocytosis induced by the nuclein obtained from the yeast through the vaginal walls.

And now comes forward one who advocates the use of nuclein locally. With a strong belief in the action of nuclein as a stimulant to leukocytosis, a theory is established and already borne out by clinical work, that nuclein may advantageously be applied locally. The direct application of nuclein to affected parts supposedly increase the number of leukocytes that act as natural scavengers, and thus gets rid of the invading germs.

Kassel, of Berlin, and Vaughan and McClintock, of Michigan, have found that nuclein has germicidal properties. The germicidal constituent of blood serum is a nuclein which is undoubtedly furnished by the polynuclear white corpuscles.

However, the immunity secured by repeated injections of smaller quantities of nuclein is not due to the direct germicidal effects of this substance, but to its stimulating effect upon

some organ whose function it is to protect the body against bacterial invasion.

The longer the nuclein injections are continued and the more frequently they are administered, the more complete the immunity secured. Nucleins are quite free from poisonous properties and hence there is no danger from cumulative effect. This has been shown by repeated daily injections for six months at a time without producing injurious effects.

The rate of increase of white corpuscles under the administration of nuclein depends on the individual, as there is no uniformity of increase.

Jacob Meisen, in his experimental work with nucleinic acid upon dogs, showed that subcutaneous injections of nucleinic acid gave a marked increase of leukocytes, in one case rising from thirty-three to fifty-two thousand.

Two French workers at the institute at Geneva have given us some definite and conclusive data on the use of nuclein.

Madam S. Daskalitz Kofmann, working under the direction of Dr. Koenig, after a series of experiments, concluded that the augmentation of leukocytes commenced about the seventh hour after injection, obtained their maximum about the twenty-fourth hour and began to diminish about the thirtieth hour. She noticed the simultaneous manifestation of hyperleukocytosis in the peripheric and heart blood, contending that it was only natural that there should be a lessened leukocytosis in the peripheric while an increased number should occur in the heart blood and vice versa.

In fifty-one cases Hannes obtained the impression that nucleinic acid had a strengthening action on the resistance of the peritoneum. He found an increase of leukocytosis amounting to from 9 to 144 per cent., and a diminution of the mortality from 40 to 20 per cent.

Chantemesse has shown that sodium nucleinate has the power of producing hyperleukocytosis to a higher degree than collargol. In connection with Nihit he found that the opsonic index normally 1.6 had risen to 2.4 twenty-four hours after injection.

The serum in this case had almost doubled in phagocytic power. M. Henkel found a solution of sodium nucleinate when used subcutaneously increased the number of leukocytes.

Dr. Edgar P. Ward, of St. Louis, after an exhaustive amount of research clearly demonstrated that the intravenous injection of nuclein in the human first, markedly increased the percentage of hemoglobin; second, that the number of red cells is decidedly increased, and third the specific gravity of the blood is almost uniformly brought up to or near the normal.

Much has thus been said about nuclein in general without coming down to the definite particular cases, on which nuclein should be used and what results we may expect to obtain from its use.

In all forms of disturbed metabolism (and therefore faulty cell repair) nuclein should be freely used. When there is insufficient metabolism arising from any cause, there is defective leukocytosis—a lowered resistance. The natural nuclein product is wanting and calls for its administration.

Nuclein may be administered (1) by the stomach; (2) subcutaneously; and (3) intravenously. The stomach route is the least desirable because it is difficult to find a time when the stomach is empty—the gastric secretions affect the composition of nuclein by altering it chemically so that we can hardly be certain of its action. Nevertheless some excellent results have been reported; in these cases it was given at frequent intervals (every one-half to two hours).

Very satisfactory results are obtained by administering nuclein subcutaneously. This method is excellent when a local hyperleukocytosis is desired, and if at all possible the injection should in such cases be made into or near the lesion in order to produce the increased leukocytosis, where it will do the greatest good. For general systemic effect the injections may be made anywhere, but it is best to inject the solution in a place where there is a large amount of loose areolar tissue under the skin, and where the latter can be freely lifted up from the subjacent tissues. From two to four hours afterward a swelling forms at

the point of injection, which generally disappears in the course of a few hours, but may persist for as long as half a day and may occasionally be quite painful.

Guillermín working under Askanzy at the institute at Geneva noted the fact that intravenous injection of nucleinic acid gave as marked leukocytosis as did the subcutaneous method.

The throwing of the nuclein directly into the blood stream by the intravenous method has gained preference in late years; it gives more certain results than do other methods of administration, and is attended with less pain and discomfort.

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THE "Horsemen's Banquet" was held at the Hotel La Salle, Chicago, November 29, last. This dinner was given by the *Live Stock Journal* through its editor, Mr. Theodore Butterworth. The *Live Stock Journal*, founded by Mr. Butterworth twenty-two years ago, is one of the best horse papers published, and a friend and supporter of the veterinary profession.

IN perusing the November 9th edition of the *Breeder's Gazette* we had the pleasure of coming across a strikingly life-like picture of Dr. W. H. Dalrymple with his right hand affectionately grasping the left horn of a beautiful Jersey cow, addressing an audience of agriculturists from a car on the "Louisiana Special," on the types of cattle. This "Farm Special," operated by the Southern Pacific in connection with the Louisiana State University and its experiment stations, consisted of seven cars: two of implements and machinery, two of cattle and hogs, one of exhibits of farm crops and truck, a dining car and a drawing room car. It had a twelve-day run, including forty-two two-hour stops, and is unique in agricultural fair projects. It proved a marked success. We also read with much interest an article by Dr. Dalrymple in the *Gulf States Farmer*, entitled, "Veterinary Science and Agriculture," in which the doctor takes his readers through the conditions of veterinary medicine from the days of hoodooism and nostrums down to the present; explaining to them the relationship of the veterinarian to the stock-raiser and the public, in his broad conception of it, and finally giving them statistics and data on agriculture, especially in the South, that will prove very valuable to both the agriculturists and the profession he represents.

## JOHNE'S DISEASE.

BY D. B. CLARK, STATE VETERINARIAN, MADISON, WIS.

"Johne's Disease" is also known as "Specific Chronic Enteritis of Cattle," "Chronic Bacterial Dysentery of Cattle," "Enteritis Pseudo-Tuberculosis Bovis" and "Chronic Acid-Fast Bacterial Dysentery."

This disease was first described by Johne and Frothingham in 1895.<sup>1</sup> In 1904 Markus reported having seen the disease in Holland.<sup>2</sup> Cases have been reported in England, Germany, France, Belgium, Switzerland, Denmark, Norway and in various parts of the United States. The first case in America was diagnosed by the late Dr. Leonard Pearson in Pennsylvania in 1908.<sup>3</sup> Later Beebe described cases he had seen in Minnesota and Wisconsin,<sup>4</sup> and Mohler has observed cases in Virginia.<sup>5</sup> I had the privilege, together with Dr. A. S. Alexander, of posting my first case, in Wisconsin, November, 1908.

From this brief statement it will be seen that the disease is quite widespread.

The first case described by Johne and Frothingham was in a six-year-old cow that had been scouring and slowly becoming emaciated for five months. Tuberculosis being suspected, the tuberculin test was applied with a slight reaction. The animal was killed and no tubercular lesions found. The only lesion noticed was a thickening of the walls of the small intestine. Upon microscopical examination this thickening was found to be due to a diffuse infiltration of the mucous membrane with lym-

\* Presented to the forty-seventh annual meeting of the American Veterinary Medical Association, San Francisco, Cal., Sept., 1910.

<sup>1</sup> *Zeitschrift f. tiermedizin*, 21 Bd.

<sup>2</sup> *Zeitschrift f. tiermedizin*, Vol. 8.

<sup>3</sup> AMERICAN VETERINARY REVIEW, February, 1908.

<sup>4</sup> AMERICAN VETERINARY REVIEW, September, 1908.

<sup>5</sup> Twenty-fifth Report, B. A. I., 1908.



phoid cells, an especially large number of epithelioid cells and a few giant cells. The epithelioid cells and giant cells contained a large number of small acid-fast bacilli, which could not be distinguished from tubercle-bacilli in staining properties. The organism was smaller than the tubercle-bacillus, and usually found in large numbers, located within the epithelioid and giant cells. They saw what they thought was caseation, but subsequent research has shown that what they thought was caseation was only a post-mortem change. They were of the opinion that this was a non-ulcerating form of intestinal tuberculosis due to an attenuated bacillus, probably the avian tubercle bacillus. Later investigators, such as Bang, McFadyean and others, are of the opinion that this is a specific disease in no way related to ordinary tuberculosis. They state that it differs from tuberculosis in that no caseation is found, no ulceration and the histological structure is not that of ordinary tuberculosis.

It is not my province to go into the bacteriological or minute pathological phases of this subject, nor am I sufficiently familiar with these considerations to discuss them in detail. To make my paper more complete, however, I will merely mention some of the more essential bacteriological and pathological considerations.

Up to the present time it has been impossible to isolate in pure culture the acid-fast organism which undoubtedly is the ætiological factor in this disease. So far as I know, it has been impossible to reproduce this disease in other species than the bovine. Dr. Bang, of Copenhagen, has been able to transmit the disease to healthy cattle by feeding them the parts of affected intestines of cattle that had died from the disease. All investigations have obtained uniformly negative results on attempts at inoculating laboratory animals such as guinea pigs, rabbits, hens, etc. The organism differs, therefore, from the ordinary tubercle bacillus in that it is not virulent for ordinary laboratory animals, is an exclusive parasite in that it cannot be cultivated outside the animal body and that it produces no caseation. It resembles the tubercle bacillus in that in staining properties it is an acid-fast organism.

In this paper I shall discuss first, symptoms and course; second, gross post-mortem lesions; third, diagnosis, and fourth, treatment.

*Symptoms.*—The first indication of the disease is a great falling off in flesh of the animal without any apparent cause, the appetite remaining normal. In a longer or shorter time the animal begins to scour violently and may continue to do so for a few days or even as long as a month. The feces are almost as thin as water, dark in color and have a peculiar, disagreeable odor. This scouring may disappear for weeks or even months to again reappear. During these periods of remission the feces may become normal or nearly so, and the animal seems to pick up. We have found by weighing, however, that they maintain their body weight but do not increase in weight.

The intervals are followed by a rapid loss in flesh and usually but not always by renewed violent scouring. Quite often animals show their first symptoms immediately after calving, and the symptoms are more violent at this time, and rarely show any signs of improvement.

The disease most always attacks strong, vigorous, full grown cows. In Wisconsin we have never seen the disease in old cows nor in very young animals, but Bang reports having seen cases in young calves. We have only seen the disease in one bull. That this is the case is probably due to the fact that on the farms where we have observed the disease, the bulls are kept away from the rest of the herd except at time of service. In one case where a bull was affected, the animal ran for several hours a day in a paddock containing a pile of horse manure mixed with the manure from a cow suffering from the disease. It seems highly probable that the bull contracted the disease from this contaminated manure. This case also illustrates the infectious nature of the malady. Why young animals do not show symptoms of the disease is probably not due to any lack of infection, but since the course is so chronic the animals do not show symptoms until they are quite mature. The young animals may be infected, but are probably passing through the long period of incubation of the dis-

ease. This, however, is merely a suggestion and is not based on any scientific investigation.

The animals manifest no pain during scouring and have no abnormal temperature. During periods of scouring the animals may become prostrate and die, after having emaciated to mere skeletons and remaining prostrate for some days.

Bang mentions having seen cases where the customary scouring did not appear, the characteristic symptoms being then emaciation and falling off in milk yield.<sup>6</sup> No such cases have been observed as yet in Wisconsin.

The duration of the disease after the first appearance of symptoms is from six months to three and one-half years. Three and one-half years is the longest time we have observed an animal live after showing symptoms of intermittent scouring. Dr. Bang writes of cases where an apparent recovery was made, but states that the observations were not conducted over a sufficient length of time to warrant any positive statement in regard to this matter. It has been our experience in Wisconsin that cases which have shown symptoms are uniformly fatal.

*Post-mortem Findings.*—At post mortem the cadaver appears very emaciated, the fatty tissue shrunken and jaundiced, but at times is normal. The folds of the abomasum appear œdematous. On outward examination the small intestine appears thickened in places. By running the intestine between the first finger and thumb you can feel the thickened portions of the organ. These thickenings will extend for from six inches to four feet and you may then feel a perfectly normal stretch of wall for some distance to be again succeeded by a stretch of thickened wall. As a rule the greater part of this thickening is found in the last two-thirds of the intestine. On opening the intestine its contents are scant and slimy. The Peyer's patches are either normal or somewhat swollen. At the thickened portions of the wall the mucous membrane is very much corrugated and folded. The direction of the fold is usually transverse to the lumen of the gut, but they may at times be longitudinal or

<sup>6</sup> Ninth International Veterinary Congress, September, 1909.

oblique. The surface of the fold is smooth, while the depressions between the folds appear warty or granular. Dr. Bang in his early paper described this warty appearance and stated that it was due to tissue erosion or loss of substance, but in a subsequent paper corrects this view by stating that in freshly fixed sections the epithelioid covering appears intact on all parts of this granular surface.

Bloody hæmorrhagic spots are occasionally seen on the surface but no ulcerations.

The mesenteric glands are often swollen, and on section appear succulent and pigmented. It might also be stated that the bacilli are found within these glands.

The kidneys and organs of the abdominal cavity appear normal, as do also the organs of the thoracic cavity.

A striking thing is the seeming lack of relation between the extent of the lesions and the violence of symptoms. Some animals may show a slight thickening on post mortem and have shown the most violent scouring before death. Bang states that he has seen cases where the animals have scoured violently, but after death nothing abnormal was found in the gross, it being necessary to resort to microscopical examinations to demonstrate the characteristic infiltration. On account of this lack of relation between lesions and symptoms, many investigators are of the opinion that bacterial intoxication plays an important role.

*Methods of Diagnosis.*—In a disease running such a chronic course, an early diagnosis is of vital importance. Dr. H. Markus in Holland published a paper in 1904, in which he states that he was able to diagnose several cases by cover-glass preparations of rectal scrapings from animals suffering with the disease (*Zeitschrift f. tiermedizin*, Vol. 8). He made rectal scrapings, stained smears and searched for acid-fast bacilli with a microscope. Bang also mentions this method (paper given at Ninth International Veterinary Congress, September, 1909). He used his thumb nail to pinch off parts of the mucous membrane. Mr. A. Meyer in Kolles' laboratory at Bern has been able to diagnose two-thirds of his cases by spreading the feces

out upon a flat plate and searching for particles of mucus. Stained cover-glass preparations revealed the bacilli. Bang states that he has tried this method in some cases with, and in other cases without results. These methods give results after symptoms appear, but a method far more valuable than these has been brought out in some recent work by Dr. O. Bang, of Copenhagen.

He first began experimenting in 1907 and the idea came to him to try the effect of tuberculin made from avian cultures, and has obtained some remarkable results. (*Centralblatt f. Bakt.*, 1 Abt., pp. 450-455). He found that animals suffering from Johne's disease did not react to ordinary tuberculin even in doses of 2 grammes, but that doses of from .75 to 2 grammes of avian tuberculin caused a distinct rise in temperature similar to that produced by ordinary tuberculin in tubercular cattle. He shows some very pretty reactions in his paper and states that they react in every way similar to tubercular cattle. They often show physical symptoms of scouring, shivering and loss of appetite some hours after injection. He has checked up these reactions and found the animals affected on post mortem. In some cases where the animals were badly affected, they failed to react, thus showing a similarity to tuberculosis.

To try this method Dr. Ravenel prepared a small amount of this tuberculin at the State Hygienic Laboratory at Madison, and a test was made upon a herd in Wisconsin in which the disease has been known to exist for at least ten years. This test gave four suspicious reactions and the animals were killed. Post-mortem examination showed nothing, and specimens were sent to the State Hygienic Laboratory for examination, but neither the bacilli nor the characteristic infiltration of epithelioid cells was found. The herd was retested this spring with one animal showing a reaction. The animal, however, is a very desirable one for breeding purposes, and has never shown any symptoms. She has been isolated and will drop a calf in the fall and will probably show symptoms at this time if she is affected. It was our intention to try this method more extensively



in the various herds in our state that are affected, but other duties have prevented. From our experience in Wisconsin I can say nothing for or against this method for the animals we killed gave only a slight rise in temperature (not enough to call a positive reaction) and the animal that has reacted is still alive and showing no symptoms of ill health. I might also state that in our first test a sufficiently large dose of avian tuberculin was not given as only .33 of a gramme of the Old Koch tuberculin (the ordinary dose of tuberculin used in testing cattle) being given, and Dr. Bang used doses ranging from .75 to 2 grammes. In the second test, however, a dose of 2 grammes were given, with one reactor, which is as I stated, still alive. From the reports in Dr. O. Bang's paper, it seems that this method is quite reliable, and we intend to do more work with avian tuberculin.

*Treatment.*—Therapeutic treatment of this disease has been of no avail. Since the scouring is of such an erratic nature in that it often lets up of itself without any medicinal treatment or change of food, it becomes impossible to determine the exact value of any given treatment. We can only hope to obtain beneficial results from such drugs that have a direct effect upon the causal organs, and as long as this organism has not been cultivated, we can hardly expect a rational therapeutic agent. Therapeutics, therefore, offer no solution to the problem, but since the infectiousness of the disease has been proven, it should receive treatment as such, namely, that of prophylaxis. The extent of the disease and its very unfavorable prognosis makes it apparent to everyone that measures for its prevention should be taken.

Owners of affected herds in Wisconsin have isolated the animals showing symptoms and keep a separate attendant for the affected animals and do not allow this attendant to visit barns in which healthy animals are kept until the suit he wears has been changed, his hands thoroughly washed and shoes disinfected. The manure from the affected cattle is hauled to fields which cattle never enter. A most careful method of scrubbing and disinfection with creolin and carbolic acid has been used in barns where affected animals have been kept. Two of these



owners tell me that they think they have about eradicated the disease from their herds by this method, but sufficient time has not as yet elapsed to venture any definite statement. One breeder states that he has lost fourteen head in the last twelve years, his last case dying about a year ago.

If avian tuberculin has the diagnostic value that Dr. O. Bang claims for it, it will be a mighty weapon in the war against this disease, for it will then be possible to diagnose the disease in its early stages and isolate reacting animals even before they show physical symptoms. It must be borne in mind, however, that tubercular animals will also react to injections of such large doses of avian tuberculin that the test should always be carried on in conjunction with the ordinary tuberculin test. The tuberculin test should first be applied and after two or three months have elapsed a test with avian tuberculin should be applied. If an animal reacts to both tests, we cannot be certain that she has Johne's disease, but we may be certain that she has either tuberculosis or Johne's disease. It may also be possible for an animal to have both tuberculosis and Johne's disease at the same time. These reacting animals could then be isolated under a system similar to the Bang Method for the Eradication of Tuberculosis.

# REACTIONS GIVEN IN DR. BANG'S PAPER.

Temp. before Injection.	Temperatures next day.					
	9	11	13	15	17	19
101.6.....	104.3	104.7	104.7	105.8	104.1	103.6
101.8.....	104.5	104.1	102.8	100.9	100.6	102.2
101.6.....	104.1	103.8	104.1	103.8	104.3	103.4
101.6.....	101.3	102.3	102.2	104.3	105	102.8
100.9.....	104	104.1	103.2	101.8	101.6	102.3
100.7.....	104.7	105.6	105	105.2	105.8	105.8
101.1.....	102.9	104.1	104.1	103.2	103.2	102.5
101.1.....	103.2	104.1	104.9	104	104.3	104.3
101.1.....	102.3	103.8	103.8	103.8	103.2	102.5
100.3.....	102.5	101.8	102	102.2	104	104.9

# TEMPERATURE RECORD OF THE REACTING ANIMAL FOUND IN WISCONSIN.

Temp. before Injection.				Temp. after Injection.			
2	4	6 P. M.	7	9	11 A. M.	1	3
101.4	101.2	101	101	103	102.6	103.2	104
							102.4

## THERAPEUTICS OF THE H-M-C COMPOUND AND ITS VALUE TO THE VETERINARIAN.\*

BY JOHN LYNN LEONARD, D.V.M., SPENCER, N. Y.

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One of the foremost requirements of the veterinarian is to relieve pain. This, of course, may be from a number of different causes. The most common trouble of this sort is colic in the horse. Then follow a few others, which, although important, need not be mentioned here. Next in line is the pain caused by operations. These are the two subjects, largely, on which I am going to speak.

For the former we have several good remedies, such as chloral hydrate, cannabis Indica, morphine, carminatives, etc., aside from the hypodermic purgatives. The most of these, however, have to be given by the mouth together with a pint or so of water. Even though they may work very nicely, when once gotten down, it is, nevertheless, a slow, tedious and uncertain process. Some animals are very good to take down medicine in this form, with the syringe, while others would rather die than to swallow a mouthful, and I have had those which I almost wished would, so that I would not have to bother any more with them.

One day as I was returning from a case of colic, which I had quieted down with chloral, I happened to have a pamphlet on the H-M-C Compound in my pocket. The drive was long and rather lonely, so I drew the paper out and looked it over. I noticed that the preparation was highly recommended for colic. I thought this would be a fine scheme if it would only work, and so sent for one bottle merely to try it.

This compound is put up in two sizes for the horse, namely Formula A and Formula B. Formula A is as follows:

Hyoscine Hydrobromide, gr. 1/10.

Morphine Hydrobromide, gr. 2½.

Cactin, gr. 10/67.

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\* Presented to the twenty-first annual meeting of the New York State Veterinary Medical Society, Ithaca, August, 1910.

Formula B is one-half the strength of Formula A and is the size most used.

In a few days a client came hurrying in and said that one of his horses had gotten into his seed rye, eaten a large amount, then drank some water and was then very sick. I hurried to his place and found the animal in very bad condition. I at once thought of my H-M-C's, but the case was so serious that I was afraid to use a preparation unknown to me in a circumstance where no time was to be lost, nor any experimenting done. However, I decided to chance it, and gave one of the full-sized tablets. To my great surprise, and also the owner's, in about ten minutes or less the animal was perfectly easy and eating hay, as though nothing had happened. A quart of raw linseed oil was then administered and the result was a complete and speedy recovery.

From this action I decided that the preparation was invaluable, and it has been my constant companion ever since.

Case after case of colic has since come under my charge, but the H-M-C has always been ready to do its task, and it has taken a pretty severe case not to be conquered by it in a very short time.

I have found this is not only good for colicky pains, but also for pain from other causes.

One night I was hurriedly called to see a driving mare which the owner thought had broken her leg, or strained herself badly. As soon as I arrived, I discovered that I had a very severe case of lymphangitis to deal with. The mare had a high fever, was panting and suffering great pain. The first thing that I did was to give her a hypodermic of H-M-C Formula B (half size). In a few minutes the animal was resting quietly, and in a sort of stupified condition. She was one of the peevish or "touchy" kind; so much so that she strongly objected to having the hypodermic needle introduced, and even tried to bite me while inserting it. Under the effects of the drug, however, she was a different horse. I could do anything I wished around her and it was alright, except that she would flinch when I touched the inflamed limb. The next step was to administer a good purgative

and a diuretic, and commence hot fomentations on the part, which were kept up until the trouble was relieved, together with the other usual treatment. During the whole night the mare rested quietly, and by morning the condition was so improved that no more anodyne was necessary.

Later on a case of intestinal catarrh came under my charge. A free passage had been obtained, but the animal, although in no great pain, apparently, was very restless and pawed almost continually. Occasionally he would lie down, but in a little while he would be up again repeating his former actions. I injected a Formula B tablet, and in about five minutes he was standing quietly. As the effects of the drug would wear off he would begin to get restless again. I was on the watch for these periods, and, when one dose was exhausted, would give him another to keep him easy. Never more than two doses in a day were necessary. In the meantime the treatment had consisted of soothing, laxative and anti-fermentative agents until recovery took place.

Along in the winter I had an obstetrical case in a cow, in which it was necessary to resort to embryotomy. The animal was quite restless, straining very hard and suffering a good deal. I gave her one of the full strength tablets to ease her, and also allow me to work to better advantage. In a short time she seemed greatly relieved and remained much quieter for some time.

Since then I inject a full strength tablet whenever I have a long job on my hands in obstetrical work. It does not stop the straining entirely, but modifies it to a large extent and causes the patient to behave much better, so that the veterinarian can work much more rapidly and easier. It also puts the animals in shape to stand the operation better, so that they have more strength left after it is through with, and can make a speedier recovery. I also use it in cases where the calf has been removed and the cow has a tendency to strain, and so cause danger of inversion of the uterus, or vagina. The drug is used in the town where I live by human physicians in their obstetrical work, as well as to quiet

pain, or restlessness from any cause, and they think there is nothing like it for those purposes.

I noticed in the pamphlet that the compound was a direct antidote for strychnine. I was just nicely getting anxious to give it a trial in that line, when one day I was favored with a case. A valuable two-year-old heifer had been given an overdose of strychnine to brace her up after a hard struggle at calving. She lay on the barn floor stretched out on her side, and having one spasm after another. The least noise, or slight touching of her, would cause her to jump nearly clean from the floor. Heavy blue clouds hung all around and the owner, too, was having spasms, but of a different nature. As soon as possible I injected a tablet of Formula A. In about ten minutes she was greatly improved. I waited a few minutes, and then gave her another tablet of the same size. In about half an hour she seemed entirely free from the spasms and endeavored to get up. With a little help, she accomplished this, and was soon licking her calf and appearing perfectly natural.

Several veterinarians have reported excellent results in cases of strychnine poisoning in the dog. Although I have not yet been so fortunate as to be able to try it in this case myself, I am positive that it will work alright.

Another favorite use of the compound with me is in operative work on the dog, especially in bitch spaying. For these animals the regular human size tablets are used. They are put up in two sizes, called respectively No. 1 and No. 2. No 1 is as follows:

Hyoscine hydrobromide, gr. 1/100.

Morphine hydrobromide, gr. 1/4.

Cactin, gr. 1/67.

This is one-tenth the strength of Formula A, the horse size.

No. 2 is one-half the size of No. 1, hence is called the "Half Strength" tablet.

I do not use the half strength tablets at all, except on my very smallest dog patients, and even then rarely, as the compound can be used much more freely on dogs than is generally supposed. This I found from personal experience.

While in college we used to use a full strength tablet for medium sized dogs. In about twenty to thirty minutes we would place the patient on the table and give an anæsthetic composed of two parts ether and one part chloroform. In a very few minutes, and only having to use but a little of this mixture, we had very good general anæsthesia, and the dog would sleep for an hour or more after the operation. This seemed to me a marvelous advance over the old way of using ether alone, as you all know how hard it is sometimes to get a dog under the influence of ether, and when you once get him there, he will come out of it very readily, so that it is necessary to keep administering it continually throughout the operation. Chloroform alone requires an expert to administer it, or death will result from a trifle of an overdose. Either of these, of course, requires an assistant in order that the operator may safely and rapidly do his work.

Far still was this process ahead of the old time method of strapping a bitch down, or hanging her up by her heels, and going at her in a butcher fashion, which, I am very sorry to say in this day and age, is still practiced by many veterinarians.

With the H-M-C preparation there is no excuse whatever for operating on dogs without an anæsthetic, except in very, very rare cases.

Before starting out for myself to use the compound in operative work, I was informed that it could be used with perfect safety in much larger doses in dogs. So, on my next case in spaying, a bitch weighing about thirty-five pounds, I gave two of the full strength tablets. In about half an hour she was quite drowsy and heedless of her surroundings. I waited another half hour and then placed her on the table. A little of ether-chloroform mixture, previously mentioned, was administered by an M. D. friend of mine, and complete anæsthesia soon resulted and lasted during the entire operation with the occasional addition of a few drops of the liquid anæsthetic. When removed from the table and started for home in a wagon, the bitch was still sleeping. A very good recovery occurred.



I was very well satisfied with a result of this kind and used the preparation in this proportion for some time.

After a while I decided that I would increase the dose of the H-M-C. This patient was a young collie bitch, weighing about thirty pounds. I gave her three of the full strength tablets. In the meantime, while I was waiting for it to act, I set about sterilizing my instruments, mixing up the ether and chloroform, etc., preparatory to the operation. In about three-quarters of an hour I thought she must be ready. I went out in the yard to get her and found her lying on her side, apparently dead to the world. I carried her in, shaved the field of operation and placed her upon the table. A neighbor veterinarian was assisting me with the work. I placed some of the ether-chloroform mixture to her nose and told him to hold it there and use his own judgment as to giving it. I looked at the bitch again and then pulled it away, fearing to give her any, as she seemed to be so sound asleep. I told him to keep watch of her and give it as she needed, and I would go ahead with the operation. I made the incision through the skin, but the bitch did not seem to mind it. I then continued the operation and completed it, even to washing up afterwards, without a single drop of the ether-chloroform mixture, yet having complete anæsthesia. After being removed from the table she slept for some time, and then awoke, gradually gained her strength and equilibrium and was up trotting around as though she had never had an operation.

My next case I treated in the same way. I was a little slow in getting ready for her, and she seemed a little livelier than I really liked when placed upon the table, so I gave her another full strength tablet. This soon quieted her down, and I went on with the operation as in the preceding case. She made a very good recovery, and in a few days was able to be shipped south.

Since then my chloroform and ether bill for dog operations has been very light. In fact, although I always have it ready, I never use it. If my patient is not under it sufficiently to suit me, I give her enough more of the compound so that she is.

I was called one morning to see a fox terrier, which I found to be suffering from meningitis. He was very old, and so serious that I advised destroying. The owner gladly consented. I gave him two full strength tablets and soon had him sleeping. I then administered clear chloroform to him and the little fellow was soon out of his misery without a struggle, much to the satisfaction of his owner, who was the superintendent of the Humane Society, and very much opposed to animal suffering.

This preparation has five distinct advantages:

*First*—You get complete general anæsthesia, and the patient sleeps for some time after the operation, thus giving the owner a chance to get home before it wakes up.

*Second*—No skilled assistant is necessary, which is of great value, especially to the country practitioner.

*Third*—Vomition nearly always occurs, and usually urination and defecation in a few minutes after injection, thus emptying the stomach, bladder and rectum, and greatly facilitating the work of the operation.

*Fourth*—There are no bad after-effects following the use of the compound.

*Fifth*—It is inexpensive compared with chloroform and ether.

It is a most excellent agent for relieving pain of any sort in the dog, and works much nicer than plain morphine, or morphine and atropine.

In the cat, however, it is contra-indicated, as even a small dose acts like morphine in this animal, causing delirium, which is very marked, and lasting a number of hours. I myself have only tried it but once on the cat, and as the small boy said when about to be punished, "I'll never do it again."

As a general anæsthetic it does not work the same in the horse as in the dog. It fails to produce complete insensibility. A report of experimental work done in one of the Western colleges states that they were successful by combining it with chloral. I have not tried anything of this sort myself, and so am not in a position to talk on it.

In the ordinary cases of colic or other mild or medium cases of pain in the horse, I use one tablet of Formula B. This usually is sufficient to ease the patient in a very few minutes. If the case is quite severe I use a tablet of Formula A, which is just twice the strength of Formula B. In case I get little relief from the first dose, I repeat it in twenty to thirty minutes. As soon as I get my patient quiet, I give a good purgative to remove the cause of the trouble.

DR. E. P. BARNHART, B.A.I., has recently been transferred from field work in Salt Lake City to post-mortem work in Cleveland, Ohio.

DR. ARCHER E. PARRY, of New York City, officiated in the capacity of veterinarian to the U. S. army horses at the National Horse Show in Madison Square Garden in November, having been temporarily appointed for the Department of the East.

THE Veterinary Session of the Cleveland Academy of Medicine has reconvened for the winter sessions and expects to have some interesting and profitable papers presented at their several meetings. This active body has appointed a legislative committee to take care of matters relative to the practice of veterinary medicine in the State of Ohio.

WE are recently in receipt of *Bulletin No. 17*, issued by Commissioner Pearson of the State Department of Agriculture, entitled, "A Partial List of Owners of Pure-Bred Live Stock in New York State." It covers most of the breeders and owners of pure-bred live stock in New York State in 1910, the kind of live stock and the number owned in each case. In one part of his introductory statement Commissioner Pearson says: "New York State justly may be called the home of several of the chief breeds. Altogether there are here recorded 65,962 pure-bred animals of all kinds owned by approximately 4,706 persons." It is a most instructive little bulletin of about fifty pages, and should do much to encourage the breeding of pure-bred animals in the Empire State.

## OBSERVATIONS ON BURSATTI.\*

BY CHESTER L. ROADHOUSE, D.V.M., BERKELEY, CALIF.

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*"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."*

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During the past summer the Agricultural Experiment Station of the University of California has conducted investigations of animal diseases in the Imperial Valley, California. Of the various diseases reported, bursatti (summer sore) proved to be the most important for the reason: first, that considering the size of the valley there were many cases, and second, that no particular treatment had proved satisfactory.

The Imperial Valley itself is of interest from the fact that a large part of it is below the level of the sea. The Colorado River carrying to its mouth great quantities of salt deposit has filled up the Gulf of California at the point where the river empties so that the northern part of what was once the Gulf of California and which was once connected with the waters of the Pacific Ocean, is now what is known as the fertile valley of Imperial. Previous to the introduction of irrigation this was an absolute desert.

The term "bursatti" is derived from the Indian word, "Burat," meaning *rain*. The term literally means *rainsore*. The annual rainfall in the Imperial Valley is less than four inches, and there is no rain whatever between the months of June and October, the period during which the disease develops.

Practically all of the livestock in this valley drink from settling basins where the water is allowed to stand until the sediment separates from the water, leaving it clear. Horses and

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\* Presented at the forty-seventh annual meeting of the American Veterinary Medical Association, San Francisco, Cal., September, 1910.

cattle frequently are allowed access to these settling basins, where they stand for hours during hot weather. Fungi and insects of various kinds thrive in these settling basins, when the water is not changed frequently.

The climate in the Imperial Valley is very hot during July and August and there is considerable moisture in the air from the extensive irrigation of the land. I mention these facts to bring out the possible influence, which these conditions may have in relation to the cases of the disease which I shall mention. Since 1904, twenty-one cases of this disease have developed in the Imperial Valley. The ages of the animals affected varied from nine months to twenty-five years. The lesions were located at the following points: breast, lumbar region, abdomen, side of face, prepuce, mammae, front of forearm, legs below the knees and the fetlocks. The legs below the knees and hocks and lower parts of the body suffer most frequently.

In all of these cases the animals were allowed free access to standing water, which in many cases was stagnant, covered with fungi and filled with insects of various kinds. Some of the animals that developed the disease had stood with the water reaching to the body during the hot part of the day. On one ranch three cases developed in one season and one case had developed the previous year. Another ranch developed three cases the same year, and there are other ranches from which two cases are reported. My observations were confined to four animals.

CASE NO. 1.—Mule, 25 years old, was in fair flesh; developed the disease June 1, 1910, and was brought to me for treatment on June 7th. The lesion was located on the breast.

*Symptoms: Lesions.*—There was considerable local swelling and thickening of the skin and the tissues immediately beneath. This swelling, well-circumscribed, extended over an area of about 6 inches by 8 inches. In the center of the swelling was a fistula one-half inch in diameter, which drained a necrotic area extending about 2 inches into the tissues and turning almost at right angles and continuing about 3 inches further beneath the skin and subcutaneous tissue. The hair was falling out over a small

area surrounding the opening of the fistula and a yellowish, watery fluid, sometimes resembling bloodstained serum, and which is characteristic of bursatti, exuded from the wound drop by drop, slowly but continually. This fluid was later seen to be secreted only from the granulating tissue.

*Treatment.*—Operated immediately, removing a section of tissue 4 inches by 6 inches and  $2\frac{1}{2}$  inches deep, which included most of the swollen, thickened tissue around the wound and all tissue which had an unhealthy appearance. Within a week excessive granulating tissue had developed at two points within the wound. This tissue continued to grow and spread rapidly despite the following treatment: Washed thoroughly once daily with 3 per cent. solution of carbolic acid, followed by covering the wound thoroughly with dusting powder composed of boracic acid, salicylic acid, acetanilid and iodoform. Carbolic acid and salicylic acid have been recommended for use in this disease, as they destroy fungi readily, and the disease was reported by Fish\* and Bitting† to be caused by a fungus found locally in the lesions. After one week, lysol was substituted for the carbolic acid, and with the dusting powder was continued throughout the treatment. The wound was covered completely with antiseptic cotton held in place by a bandage passed around the body of the animal. This was necessary to keep the flies from the wound.

When this treatment failed to check the excessive granulation and watery discharge, formaldehyde, full strength, was used on the surface and injected into the base of the rapidly granulating tissue with a hypodermic syringe. The formaldehyde caused the animal some discomfort, but the following day the serum discharge was entirely stopped and the granulating tissue dark colored, and usually by the third day the dead tissue had sloughed off, leaving a healthy appearing surface with no discharge. Although the full strength formaldehyde was used, I believe that it would produce good results if used diluted, say a

\* P. A. Fish, Leeches. Twelfth and Thirteenth Annual Reports, Bureau of Animal Industry, pp. 229-259, 1895-1896.

† A. W. Bitting, Leeches or Leeching. Annual Report, Florida Agricultural Experiment Station, 1893. Bulletin No. 24.



10 per cent. solution. The treatment was continued in this way, using the formaldehyde whenever it was necessary to check the excessive granulations. The animal remained in good condition throughout the treatment with good appetite and normal temperature. Attempts to bite the wound were noticed only once, when the bandage had loosened and dirt and flies had come in contact with the wound. A letter from the Imperial Valley, dated September 3d, reports this mule completely recovered and back at work. The recovery has taken place during the hottest weather.

CASE NO. 2.—Large sorrel horse, 8 years old, in good flesh. Was affected with this disease in 1909. Recovered at the advent of cool weather. June 25, 1910, the surface of the scar caused by the disease in 1909 had cracked and was discharging a yellowish, watery fluid. There was no swelling around the lesion. I was not able to diagnose this case positively, although the discharge was characteristic of bursatti. I filled the wound with formaldehyde as before, which stopped the discharge only temporarily. Four days later a second application of the formaldehyde stopped the discharge entirely and it did not recur. And no further trouble has resulted.

CASE NO. 3.—Nine-months-old colt, developed the disease in September, 1909. The animal had stood in water up to its body a great deal of the time. Extensive lesion over lower part of abdomen, covering a surface 18 by 10 inches. The animal recovered temporarily February 1, 1910, but broke out again in July, affecting the sides and lower part of the abdomen and the prepuce. This animal was not treated by me.

CASE NO. 4.—Black horse, about 8 years old, in good flesh. Had suffered from the disease during the summers of 1908, 1909, and again this past summer. Sent to University Experiment Station. The disease had been in progress several months. Lesion located on the left side of face, was secreting the characteristic yellow fluid. Lesions also attacking right foreleg at two points below the fetlock, which showed the development of the characteristic granular deposits. The object in this case was to

determine the effect of the cool coast climate on the course of the disease without further treatment except to protect the lesions at the fetlock by means of a gauze bandage.

Within a week the watery discharge from the lesion on the side of the face had ceased, and by the end of the second week, the necrotic granules had disappeared from the lesions at the fetlock, leaving a smooth, raw surface. A slight watery discharge reappeared from the lesion on the face for a few days when hot weather developed, but soon disappeared, and the lesions are gradually healing.

In the *Review of Recent Facts in Tropical Medicine*, Wellcome Research Laboratory\*, Khartoum, reference is made to the disease as a strange complaint associated with the presence of filaria embryos in the skin and connective tissues of horses, which is common in India. Lingard concluded from a number of observations made in the Muktesar laboratory on horses and cattle, that the filaria embryos are present in the blood of affected animals in varying numbers during the twenty-four hours, and that between 6 o'clock and 10 o'clock in the evening the number of these embryos increases enormously. They were fewer during the month of September than they were during the months of June and July.

The filaria irritans is reported from Europe as being the cause of the disease bursatti, and the embryos are reported to have been found in the circulating blood.

In America the filaria embryos have not been reported as having been found present in the blood or within the tissues of the lesions of animals suffering with this disease.

With a view of determining the presence of these filaria embryos, microscopic examinations of the blood of cases Nos. 1 and 4 were made. Wright's stain was used in the preparation of the blood smears.

CASE NO. 1.—Number of blood smears examined, 50. Number of fresh cover glass preparations examined for motility, 20.

\* *Review of Recent Advances in Tropical Medicine*. Supplement to Third Report, Wellcome Research Laboratory, Khartoum, page 219.

CASE No. 4.—Number of blood smears examined, 30. Number of fresh cover glass preparations examined for motility, 10.

Professor Herms of the Entomological Department of the University of California, assisted me in the examination of slides for the presence of filaria, and in no case did we find the embryos present.

Blood examinations of Case No. 4 showed the following:

Red blood corpuscles, per c. m., 8,008,000.

Leucocytes, 16,200.

Hemoglobin, 100 per cent.

Eosinophiles, 10 per cent. in proportion to the total number of leucocytes.

The number of leucocytes present in Case No. 4 was increased about 10,000 per c. m. above the normal. The increase in the number of eosinophiles was marked, and instead of about 4 per cent. as reported by Moore, Haring and Cady, for normal horses\*, 1 per cent. of eosinophiles were found in this animal.

Microscopic examinations of sections from the borders of the lesion from which the watery discharge is secreted were made by the pathologist at the Cooper Medical College, San Francisco, and showed the lesion to be of a rapidly granulating type containing an increased number of eosinophiles.

I realize the need for further investigation on this disease in this country. The Agricultural Experiment Station of the University of California shall continue observations on Case No. 4, with a view of bringing about a recurrence of the disease by taking the animal to a hotter section of the state at the beginning of the next summer. Further observations will be made relative to this and other cases at that time.

In conclusion I would say: 1. That we were successful in treating bursatti by excising the diseased tissues as completely as possible, followed by the application of antiseptic solutions and dusting powders.

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\* Proceedings of the American Veterinary Medical Association, 1904, p. 288.

2. That strong solutions of formaldehyde prove effective in checking the secretions and excessive granulations, without noticeable ill effects to the animal.

3. That animals suffering with extensive forms of the disease can be treated more successfully by removing them to cool climates where the disease is not apt to recur.

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THE UNITED STATES LIVE STOCK SANITARY ASSOCIATION will hold its fourteenth annual meeting at the Grand Pacific Hotel, Chicago, December 5, 6 and 7. A program rich in scientific thought from the leading sanitarians of the country, including laymen, physicians and veterinarians, has been prepared.

IN forwarding the minutes of the January, 1910, meeting of the Iowa Veterinary Association to the REVIEW for publication during the month of November, Secretary Simpson explained that he had prepared and mailed a set of minutes to the REVIEW right after the meeting in January last, and only recently discovered that they had been destroyed by an accident at the time of mailing.

ANOTHER strong veterinary organization has sprung into existence in New York State, known as the Central New York Veterinary Medical Association, with the following earnest supporters of the old State Society as charter members: W. G. Hollingworth, H. A. Turner, W. B. Switzer, F. E. York, J. A. Pendergast, Wilson Huff, L. G. Moore, D. C. Papworth, E. E. Cole, A. J. Tuxill, J. G. Hill, V. G. Kimball, E. E. Dooling, J. M. Currie, Geo. Gowland, Frank Morrow. Its territory comprises the counties of Seneca, Cayuga, Oswego, Onondaga, Jefferson, Lewis, Herkimer, Oneida, Madison and Cortland. The officers for the ensuing year are: Dr. W. G. Hollingworth, President, Utica, N. Y.; Dr. H. A. Turner, Vice-President, Syracuse, N. Y., and Dr. W. B. Switzer, Secretary and Treasurer, Oswego, N. Y. Meetings will be held in June and November, at Syracuse. The first meeting was held November 25, last, with a very creditable program. The Empire State has enjoyed the reputation of having the hardest working state veterinary organization of any of the states, and with this added opportunity for its veterinarians to work off their energy, much should be accomplished for the profession. The REVIEW offers its congratulations.

## THE NECESSITY OF PROPER TRANSPORTATION IN THE PRODUCTION OF A SANITARY MILK SUPPLY.\*

BY DR. C. A. DUKES, OAKLAND, CAL., PRESIDENT, OAKLAND BOARD OF HEALTH.

In considering the various steps in the production of a sanitary milk supply it must be conceded that one of the most important features is that of transportation. It can be readily understood that no matter how carefully milk may be handled by producer or dealer if during transit from the farm to the City it does not receive the attention and care it deserves, all precautions in other directions are practically nulled.

By correspondence with various sanitary authorities throughout the United States we have learned that with a few exceptions little systematic work has been done towards securing proper transportation of the milk supply of large cities.

In cities of 100,000 inhabitants or more the problem of milk transportation is fast becoming a vital one for several reasons.

In the first place dairy farms that were formerly operated within a teaming radius have been crowded farther away owing to the fact that land in the vicinity of such centers of civilization has become too valuable for dairy purposes.

Second, and this perhaps more particularly applies to communities located on the Pacific Coast, dairy farmers have come to a realization of the fact that in order to operate a dairy successfully and at a profit the farm must be located where an abundant supply of food stuffs can be readily obtained.

To properly supply dairies with food stuffs bringing same from distant valleys to within easy transportation to the large cities has increased the cost of food stuffs to such an extent that the production of milk and milk products under such circumstances is almost prohibitive.

It is obviously much less expensive to transport milk from locations where food stuffs may be produced in abundance than

\* Presented to the American Veterinary Medical Association, San Francisco, September, 1910.



it is to transport such food stuffs to within easy teaming distance of places where milk is consumed.

These reasons above all others have been the means of forcing the dairy farmer to seek locations at such distances from the point of consumption where reliance must be placed upon the railroads for the delivery of their product.

Climate is often an important factor. At least it must be considered so as regards conditions existing on the Pacific Slope. It is a well known fact that cows are more productive and consequently more profitable when maintained in interior localities than they are when kept in the immediate vicinity of the cities on the coast.

Until very recently little or no attempts have been made by railroads to provide adequate facilities and service which will insure the delivery of milk in as good a condition, practically speaking, as when it is intrusted to their care.

Unfortunately railroads are more prone to consider as more important the revenue to be derived at the least inconvenience to their schedules and the observation of union rules as regards the accommodation of their employees. It is quite evident that the railroads consider these matters of infinitely more moment than the necessity of proper service in the matter of transporting milk so that it will reach the consumer in a wholesome condition.

To illustrate this point we shall quote one incident in regard to the shipment of milk into the city of Oakland. Some little time ago complaint was made that the milk service on a certain road was such that milk reached the consumer after a great deal of unnecessary delay. Upon investigation it was learned that a certain train used for milk purposes was running so close to the union schedule for the accommodation of its employees, that it left no margin to come and go on. As a consequence, should it get slightly behind its schedule, milk was frequently carried past the Oakland station, and was carried to the terminus at the Oakland Mole, from where it had to be re-shipped back to its proper destination, which it reached eventually, but after having been belated for several hours under conditions that did not favor



its sanitary condition. It is true that when the matter was called to the attention of the road referred to, and when it was suggested that by changing its schedules so that the train in question could be started at the other end of the run fifteen minutes earlier, the difficulty was overcome, but this required about three months to accomplish the desired results.

Then again milk tanks in many instances are piled indiscriminately into express or baggage cars, the doors of which are kept wide open all the time. Here they are infrequently stored amongst undressed veal, poultry coops and various other farm products and merchandise, and now and then a human cadaver in a redwood box is also placed among the heterogeneous mass, constituting a most unfavorable environment.

Too often the employees of the railroad along the right of way obtain their daily milk supply from tanks so shipped, and as they take the milk at the top of the tank and observe no sanitary precautions during the operation, the subsequent condition of the milk either from a food value or sanitary standpoint can hardly be said to be improved.

Another feature is the transportation of empty tanks back to the producer. This is usually done at the convenience of the railroad, which often displays supreme indifference as to the time and manner in which it is done. Frequently tanks are shipped back to the country in cars from which live stock have recently been unloaded, or if shipped in express or baggage cars are kicked off at their destination, which is perhaps some small station where the train crew do not desire to stop. As a consequence a string of cans is formed along the road, the length of which depends entirely upon the number of tanks and the rapidity with which the train is moving. This practice does not, as can readily be imagined, add to the sanitary possibilities of the tanks or their usefulness as milk containers.

Railroads are quick to raise the issue that there is not enough profit in the milk business to justify better service, but an investigation of the amount of traffic along these lines will reveal the fact that the revenue derived from this source cannot be con-

sidered a negligible quantity. And even if it were so, it is not a good and sufficient argument that such a vital and important food product should receive irreparable injury through the fact that it has to be transported under unfavorable conditions in order to keep the cost of same within the limits of the ideas of the interested parties.

We believe a railroad should derive a fair profit from the handling of milk and milk products and in fixing its rates it should refuse to accept consignments at such rates as would preclude the possibility of caring for the same in a proper sanitary manner.

Proper cooling of cars in the summer time and running milk trains on a schedule that will meet the necessities of milk producers should be the aim and object of every railroad operating in and through dairy districts. In this connection the producers and dealers should recognize their responsibilities in the premises and should co-operate by seeing that milk is delivered and received without such delay as will necessitate milk tanks remaining on exposed platforms under unfavorable sanitary conditions for indefinite periods of time.

In conclusion we believe that if representatives of dairy organizations and sanitary authorities would agree upon certain rules governing the transportation of milk, there would not be much difficulty in demonstrating to the railroads the necessity of putting such rules into effect.

But until some such general movement is made and the parties interested come together and work for the common good, efforts along these lines must of necessity be of a sporadic nature and of little avail.

Possibly the solution of the transportation problem may be more quickly solved by establishing municipal dairies, as has been suggested by a popular magazine. Surely it is as necessary that the milk supply should be as pure as we demand of the water supply, and I shall recommend that the city of Oakland, which is about to adopt the commission form of government, give this early consideration.

## MY EXPERIENCE WITH CHOKING ANIMALS.\*

By J. A. McCrank, PLATTSBURGH, N. Y.

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Oesophageal obstructions or choke, is an accident, a malady or whatever you may wish to call it, that has often caused me much worry and no small amount of hard labor.

I have treated case after case of this kind with various degrees of success, following the different lines of treatment as laid down by various practitioners and veterinary writers in periodicals and text books. After many failures and not a few blunders, I have finally adopted a course of treatment which I will describe in this paper.

For the sake of brevity, I will omit the physiological and anatomical construction of the organs involved and proceed with my subject proper.

In pharyngeal obstructions I never have any amount of trouble in relieving my patients, and I have treated large and small. In the dog and cat a pair of forceps will always remove the obstruction, while in the cow or horse the hand is passed to the pharynx and the object is removed.

In cervical chokes I have had but two cases in the dog, the one a bone and the other a lady's thimble. In both cases I performed œsophagotomy with success. For after treatment I merely subjected the little fellows to three days' starvation, then began with small quantities of milk.

In the cow I have had but one case of cervical choke that I could not remove by outward manipulation. In that case I performed œsophagotomy after trying every other described treatment. The result was fatal. The owner *would* feed and the cow being hungry *would* eat. The solid food lodged at the seat of operation was forced through the wound among the muscles, the wound became infected and the patient died.

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\*Read before the twenty-first annual meeting of the N. Y. S. V. M. S., Ithaca, Aug., 1910.

In horses I have never been successful in relieving cervical chokes by external manipulations, and here is where I have had my troubles. And if this were a social hour, I believe I could entertain you by relating the various treatments of chokes, with accounts of my successes and my failures, but more especially the latter.

I performed oesophagotomy three times, when I retired from the field of surgery. Case I. was a feed choke; tried every other treatment before I operated. After operating I found out I was surgeon, nurse, swipe and stable boy, to maintain a social (undignified) standing in the section. My patient recovered in less than three weeks, a scientific success, but a financial and social failure. Case II.: After operating for same kind of choke, I withheld my services as swipe and nurse for four days, when I found I was obliged to fall in if I did not want my patient to die. The result was a success but another financial disaster. Case III.: I obliged the owner to supply the places above mentioned, for I could not afford to sacrifice my all for a trivial success; well, my patient died.

After that I used every other describable means to relieve chokes. I relieved a few and quite a few died from various after results as mechanical pneumonia, infected wounds of pharynx and oesophagus and once tetanus. The harder I labored the worse seemed the results; and I believe this will follow every man's effort if directed as mine were.

My lesson came. Dr. Smith's mare "Kelpie" was found choking in the lot one night, supposed to be an apple. I was called. I used the probang, I used oil, I used oil and warm water, external manipulations, but all without success. Then the doctor wanted to operate, but guided by the past I cast about for an excuse to refuse. Being now about 11 p. m., and there was but one lantern in the barn and no help, we agreed to postpone operating until morning. Hoping the animal would either recover or die before morning, I went home. Early morning brought me an urgent call to the country. When I returned "Kelpie" was out ploughing and Dr. Smith was undecided

whether to be angry or not, but a truthful explanation saved my client and my patient was saved. A second case of this kind was similarly treated with like results. Enough for cervical chokes.

In cows I have treated many thoracic chokes, though few compared with cervical, and have varying successes, some favorable, others different. I have often ordered slaughter to avoid a total loss. It was then I was ashamed of myself, because I could not save the man's property.

Some years ago a Mr. Mousso called me to relieve a choking cow; thoracic choke, a turnip. After a few trials I advised slaughter, for the animal was good beef. I punctured to relieve tympany, while Mr. M. went to the city for a butcher to come out and kill. Owing to the lateness of the hour, the butcher would not come. I left the canula in place and came home. In the morning the cow was better. Since then I have had a chance to try the same treatment a few times with success; in fact I have tried no other.

*Treatment.*—In horses suffering from cervical or thoracic obstructions, I place my patient in a stall, away from noise and visitors; place a bucket of water in the manger and leave him. I have relief in six hours, nine hours and sometimes twelve hours, but I always have relief. In cows with thoracic choke, if much tympany present, I tap the patient, leaving the canula in situ and leave her to quietness, and I meet with the effect desired.

Now this paper may not meet with the approval of every one, especially the surgeon who has all conveniences, which I have not, and practical men who will not reveal the results of their years of experience, but when it comes to a scattered country practice where proper help and appliances are not to be had, then I believe a great many more patients will be saved by my treatment than by using the knife and other heroic measures, and you are not subjecting yourself to such tedious labor and work. And above all, your fee will be more in proportion to your labor than if you operate.

## PARTURIENT PALSY.\*

By A. E. ROBERTSON, M.D.V., NASHVILLE, TENN.

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On being asked by one of the members of the association to compose and read a paper on some subject before the Second Annual Meeting of the Tennessee Veterinary Medical Association, I began to cast about for a subject that would be of interest to all present. It is possible though that the one I have chosen might not be of interest to some of the older practitioners. Each member present knows very well that a young vet. with a limited amount of experience is hardly capable of interesting an assembly of men whose field of practice has been so extensive; nevertheless I will do my best, and look forward with pleasure to the time when I will have had more experience and be able to write a more interesting paper.

No doubt you have already noticed in the program where I am down for a paper on "Hematuria in Foals," but after learning that one of my classmates was down for the same subject, and knowing his ability as a practitioner and scholar, so in order to avoid embarrassment to myself and keep down competitive strife have decided to select some other subject, namely, "Parturient Palsy or Dropping After Calving."

Have decided on this subject because I have seen more of this trouble in the past three years than any other disease or ailment. There is very little literature to be found on this subject, thereby making it very difficult for a young practitioner to recognize. It is sometimes closely allied to other conditions met with in bovine practice, especially parturient paresis.

On July 15th I was called to see a cow, which I inferred from symptom described over the 'phone, was suffering with "Milk Fever." Upon arriving on the grounds secured the following history and symptoms: Plethoric animal, third or fourth calf,

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\* Read before the Tennessee Veterinary Medical Association, Nashville, Nov. 4, 1910.



had been on rich pasture, owner reported an easy birth, cow about one-half Jersey, calf twenty-four hours old, temperature of cow 103, accumulation of urine and fæces, pupil and corneal reflexes were not disturbed, animal able to rise but very weak and tottering in walk. The pupil and corneal reflexes were the only negative symptoms of milk fever. I at once cleaned rectum, drew urine and injected one-half gr. strychnine sulphate, drenched with  $1\frac{1}{2}$  pounds magnesium sulphate plus one-half pound sodium chloride, then applied sinapism to loins and then left patient for the night. Upon returning next morning found symptoms all aggravated. I tapped the rumen and to make sure it was not milk fever, I injected the udder. The patient died in the afternoon.

About two weeks following was called to see another case with the identical same symptoms with the exceptions of a slightly dilated pupil, corneal reflexes were slightly absent, cow was about three-fourths Jersey and was less able to support herself while standing than the other patient.

I mention these cases because the symptoms were so similar and yet entirely different conditions. This trouble may be a sequel of paralysis of the posterior extremities due to carrying of large fœtuses.

I will now endeavor to give symptoms as I have observed them. It may or may not be associated with poor nutrition, have seen more cases in well nourished animals than poorly nourished. As a rule the animal is found in a recumbent position. Dr. McKinzie, of McKillip's Veterinary College, says they are unable to rise, but I have never seen a case that the animal was not able to rise and get up on its feet; of course they would stagger some in walking. Twelve to twenty-four hours before death the animals are never able to get up. Other symptoms are an increased pulse rate and accumulation of urine and fæces; these together with a history of a large calf constitutes the symptoms. About fifty per cent. of the patients succumb to the trouble.

Treatment consists of stimulants, cathartics and sinapisms to loins.

## REPORTS OF CASES.

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### CLINICAL RESULTS WITH BACTERIAL VACCINE.

By F. E. BARNES, D.V.S., Waxahachie, Texas.

In submitting this report of ten cases treated with *Bacterial Vaccine*, I will first refer to some of the advantages it possesses over surgical and medicinal treatment, which with me have given very indifferent results. One of my difficulties heretofore has been in making my patrons do *their* part of the work; now I refuse to treat one unless it is prevented from rolling and tied so that it cannot rub. I believe that in these bacterial vaccines we have a successful remedial agent for all suppurating conditions; and I include poll-evil, fistula, quitters, etc. In poll-evil it usually takes longer, due, I believe to the lack of blood in these parts. The first ten cases I have treated follow; one c. c. was given as an average dose, five days apart:

CASE No. 1.—Large bay mare; fistula of both withers; right side open; swellings large and of four months' standing. Gave one c. c. of anti-suppurating vaccine every fifth day, and four is all she received. Cured.

CASE No. 2.—Bay mule, 15 hands; both withers; discharge from both sides; secured drainage. Cured with three injections, but owner wanted to be sure and took two extra. Has worked animal with collar since a week after last injection.

CASE No. 3.—Poll-evil; badly swollen; no drainage; received six injections, five days apart. Swelling gone; looks to be sound and well at this writing.

CASE No. 4.—Quitter; right fore foot; had been discharging pus for two months or more; kept clean with peroxide every other day, with dusting powder and bandage for fifteen days, during which time he received three injections. A shoe and pad were then put on and he is now working. No lameness. No discharge after second injection.

CASE No. 5.—Small black pony; had flatulent colic and was tapped by an empiric. A week later I was called to treat the abscess. Cleansed well with peroxide; gave two c. c. at one in-

jection; went to work in five days with not even the hole showing.

CASE NO. 6.—A cow with septic-metritis; farmer removed the placenta with all the neighbors' help and advice; result, several small cavities in wall that felt like abscesses; thick, stringy; pus-discharge daily. Removed a good handful from uterus and washed thoroughly with a permanganate solution and gave 3 c. c. at one dose. After four days the discharge had stopped; appetite returned and she seems sound and well now. Owner said she had been discharging two weeks when he called me.

CASE NO. 7.—Bay mare; moderate swelling of withers; swelling entirely gone after receiving four doses of one c. c. each. Now at work every day.

CASE NO. 8.—Poll-evil; mule; four months' standing; has received seven injections to date, but owner refuses to keep animal from work and it is impossible to get good drainage. One more treatment ought to suffice.

CASE NO. 9.—Valuable bay mare; shot through scapula, ranging downward, hit fifth rib, glanced downward and outward, lodging in muscles in region of shoulder joint. Had been discharging pus through the hole in scapula for nearly two months. Owner had kept it open by jamming a good sized spike through it daily. Tapped with long trocar from depression above elbow joint upward and anteriorly and got nearly a quart of pus; this gave drainage above and below. Gave three injections of two c. c. each, peroxide one-half, water one-half, injected through hole in scapula daily for two weeks; discharge has stopped; swelling is nearly down and is walking on leg after carrying it all summer.

CASE NO. 10.—Brown horse; fistula right side; one year's standing; open and as large as a bucket; used seaton and has received two injections; swelling reduced one-half to date and doing nicely.

I use Camphalum (P. D.) dusted over part daily to keep flies away as they are very bad here, and that has supplanted all my blisters, etc. I have now a case that I operated on a week ago that is of three years' standing and is nearly a foot forward from the withers, caused by the neck strap of a breeding hopple, runs on both sides, or did until I cut a hole through large enough for one's fist, just above the fifth cervical vertebra, and removed the necrossed top of it. Did not use the anti-suppurative vaccine until yesterday.

## TENOTOMY OF ANTERIOR LIMBS.

By Dr. G. U. MARCHAND, Urichsville, Ohio.

Fig. I. shows condition of colt before the operation, August 23d, colt then four weeks old. Fig. II. shows colt's condition six days after operation, August 29th. The history of the case as related by the owner pointed out the fact that the colt was born that way, and had been treated by everybody in general, except a veterinarian, from the day it was born, and continued to grow worse until the original owner, in disgust, gave it away. I was called by the new owner, and found the little fellow with its pasterns and fetlock joints and coronary bands a mass of foetid sores, and it also had a pervious urachus. Tenotomy was advised as a possible way out of the difficulty, and was gladly accepted. The results from the operation were very favorable under the conditions met with in this case, as will be seen by the cuts on opposite page. So much so, in fact, that the former owner tried to buy the colt back, but the new owners (boys) refused to part with it "for love or money."

## A PECULIAR CASE.

By W. E. MARTIN, V.S., Wapakoneta, Ohio.

On the morning of May 2, 1910, I was called about fifteen miles from my office to attend a parturition case in a seventeen-year-old mare. On inquiry I learned that labor pains had started about fourteen hours previous to my arrival. On examination found mare eating hay with seemingly very little pain. Pulse and respiration good; found posteria presentation with hind feet in vagina. Delivery of a very large foal was brought about by the aid of two assistants, and seemed to be not at all difficult, the mare standing during the act. Immediately after delivery the mare lay down, began straining and groaning and seemed to be in great distress. I got her to her feet and attempted to remove placenta which adhered very closely to uterus. After a very few minutes I found mare seemed very weak; respiration rapid; pulse imperceptible; mucous membranes pale, and every indication of severe internal hemorrhage. However, there was very little hemorrhage into the uterus. Seeing that further efforts to remove placenta would result in death of the mare, I



FIG. I.



FIG. II.

decided to let it remain in the uterus for a while. I expected the mare to drop dead any minute. She seemed so weak she could hardly stand. I gave hypodermic of strychnine and in an hour she seemed some better. I left fluid extract of nux to be given, and requested owner to call me by 'phone next morning. He called stating mare was up and eating and that he wished me to call and see her again. I called and found my patient in fairly good condition, and removed placenta without much difficulty. Irrigated uterus with a weak permanganate solution, prescribed echinacea and returned home. One week after owner came to my office and said that for three or four days previous mare had been continually straining as if to urinate, but that very little urine was passed. I called at the place again and found, on vaginal exploration, a swelling in the floor of the vagina which extended from the vulva to the uterus, almost completely filling the vagina and crowding the bladder and urethra over to the right vaginal wall, thus causing the frequent attempts to urinate. As the swelling was fluctuating I decided it was either a hematoma or an abscess and wished to make an exploratory puncture in order to diagnose the condition. To this the owner would not consent, so I left treatment and returned home. Some two months after I saw the owner and asked him how the patient had come out. He said that about one week after my last visit the swelling ruptured spontaneously and discharged a large quantity of very stinking pus, after which the mare seemed all right and was then in good condition.

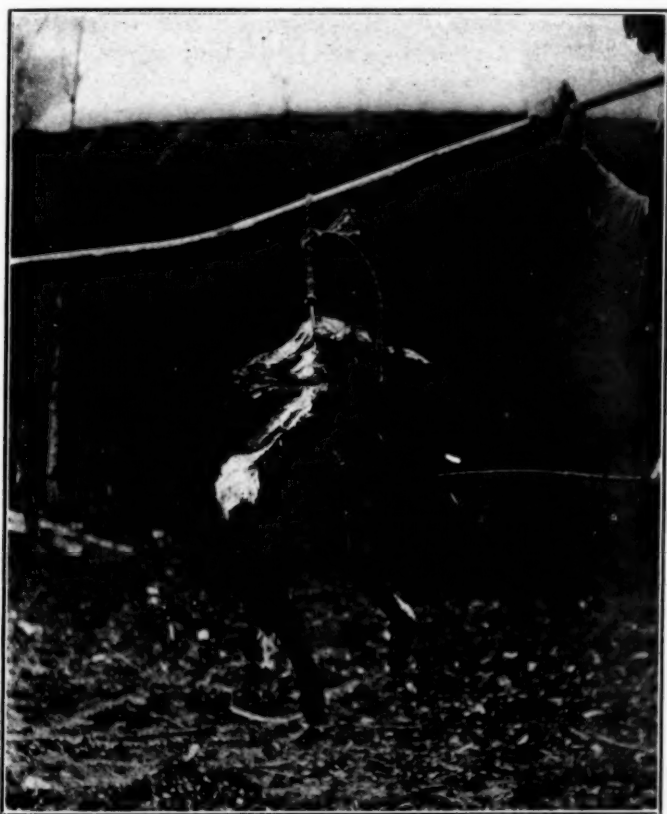
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### A MONSTROSITY.

By E. H. Scott, Johnson, Vt.

Was called to see a thoroughbred Jersey cow having difficult parturition. A mass of intestines and other internal organs of the calf were hanging from vulva. Upon examination a bone-like growth could be felt wedged into pelvic cavity; with much difficulty this was returned and an examination was commenced for head and legs, which were found in one mass. Only two of the legs showed movable joints, one forward and one hind. The jointed hind leg was brought back and out, then with aid of parturition hook the monster was easily delivered.





The abdominal cavity was grown wrong side out with croup resting on neck; head, legs and tail all pointed the same way. Head and legs were well haired over and to all appearances was a full time calf. The cow recovered nicely.

### WAS THIS AZOTURIA?

By WM. D. HOWATT, V.M.D., Portchester, N. Y.

Saturday, Nov. 5th, I drove my road horse about eight miles in the morning and about five in evening; put him in the stall for the night, gave him a scalded bran mash and regular attention, and left for the night.

Sunday morning I went to the stable at eight o'clock and into the stall to lead him out to start my morning's work. Instead

of being "snappy" and bright, I found a case of great depression, body all of a tremble, pulse tense and irregular, and left hind leg hardly able to support weight. I thought at first that in rolling he may have injured the region of hip, but could find absolutely nothing. I took his temperature and 100.4 was the highest. I led him ahead, and after three or four steps he placed weight on the leg and set it down very firm and remained with weight on the leg for, say, two minutes, shifted off to the other leg, and then would start off lame; after a few steps would again be practically normal.

He would look at sides as if colicky, paw sometimes very hard, and apparently was suffering pain; no desire for food or drink. As I had to hurry out, I left a dose of one ounce ext. buchu fld. and one-half ounce ext. digitalis fld. to be given. Did not return until 12.30, and could see no change. Gave second dose and at 3 p. m. could still see no difference. I thought azoturia was the only thing to cause so sudden and severe symptoms. At 10 p. m. repeated dose and as bowels and kidneys were in good condition, did not give a physic. Left instructions with stable man to call me if he got restless, but heard nothing, and this morning expected to find either a sure case or else complete recovery. No need to explain my happiness when he greeted me as he usually did, sound as a dollar and hungry as a bear; no indication of Sunday's trouble at all. I didn't drive him to-day, but had him led around for half an hour. This horse has done plenty of road work daily, never missing a day. Scalded mashes Wednesday and Saturday nights, and regular ration consists of 4 quarts of oats and 1 quart of bran. Why such an attack should effect him is a puzzle to me, especially so when he never gets a day off.

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#### PERITONITIS-ENTERITIS-MELONOTIC TUMOR.\*

By SCOTT WISNER, Omega, Neb.

The animal was a colt two years old, light cream color, had been castrated about six weeks before, and had made a nice recovery.

I was called to see the case at 3 p. m., and was told that he had been noticed the day before walking with a stiff gait and

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\* Presented at the annual meeting of the M. V. V. A., Omaha, July, 1910.

showing little inclination to move. At about noon he had appeared at the watering trough showing the same symptoms more aggravated, and had not left the water since that time. I found him playing with his nose in the water and pawing occasionally with his fore feet. Pulse 90, hard and wiry; respiration short and rapid; peristaltic sounds entirely absent; temperature, 107.4°. The extremities were cold, the abdomen tucked up, and the eyes had that peculiar haggard staring appearance so commonly seen in enteritis. I informed the owner that the colt had a severe case of peritonitis, which I suspected to be complicated with enteritis, and that there were no hopes of his recovering. I gave a small dose of morphine and atropine and left.

The colt died at 8 p. m., and I made a post-mortem examination the next morning. I found the entire peritoneum inflamed with extensive adhesions. The small intestine and the floating colon were also inflamed throughout almost their entire length. On the free border of the great omentum I found a large melanotic tumor which rotated, twisting the great omentum into a cord-like mass. This appeared to be the cause of the trouble, but what caused the rotation of the tumor I am unable to guess, as it was much elongated along the free border of the great omentum.

It is gratifying to read in the November number of the *Journal of the United States Cavalry Association*, Captain W. C. Short's (13th Cavalry) report of his visit to the Fort Reno Remount Station, and his account of the excellence of the type of horses there and the splendid manner in which they are handled and cared for under the direction of Captain Hardeman. Captain Short believes one very potent factor in the great improvement of the type of horses at this station, over what he found there two years previous, is the purchasing of colts instead of mature horses; by getting a better type of a two-year-old for the money than you could a four-year-old, and besides they do better by coming into the army-horse life at an earlier age and growing up in it as it were. The same number also contains an article by Veterinarian William P. Hill (12th Cavalry) on the "Care of the Horse's Hoof," and one by Veterinarian Coleman Nockolds (1st Cavalry) entitled, "Notes on the Progenitors of Certain Strains of the Modern American Horse," which are very interesting reading.

## ARMY VETERINARY DEPARTMENT.

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### PRESS THE ARMY VETERINARY BILL.

It is encouraging to see the legislative committee of the American Veterinary Medical Association five members strong, bearing names that are well known and that must inspire confidence in their skill and endurance, surely to be tested at the opening of Congress on December 4th.

For the information of the committee we have given in the November issue of the REVIEW a summary of the conditions under which our bill is held at present. Other difficulties may, of course, develop, as soon as the committee starts on its mission. As of yore the bill may again be blocked in its path by stern refusal or amicable excuse or subterfuge, methods that are so often successfully practised by legislators.

We beg the legislative committee to take a serious view of our bill. Its continuous failure since the year 1904 shows how easy it is for Congress to retard such a measure. If it fails again during the coming session, we may not only be checked in our development, but be instead subjected to a reaction that may destroy what we have gained since 1899. An army officer, well versed in Congressional tactics, recently said: "No one can tell what the future has in stock for army legislation. If a reaction should set in, it will weigh heaviest on the weakest branch of the service. Your veterinary service is very weak. Press your bill with all the strength you can muster. You should realize now, if you have not done so before, that it was only by a hard fight that we secured for you the recommendation to Congress, embodied in this bill, for your retirement on disability and old age. This passus was mainly won in the General Staff because you have a few *Civil War veterans*. They are now very old men, and should they die before the passage of your bill, I fear that you might revert to the civilian status of the contract surgeon. This is a worse position than the one you occupy now, and one that would represent a step backward."

We in the army know that this view is not overdrawn. It is a serious view, indeed, and should be a sufficient incentive to stimulate the members of the legislative committee to most zealous action. We wish them Godspeed in their work. O. S.

## ABSTRACTS FROM EXCHANGES.

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### ENGLISH REVIEW.

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By Prof. A. LIAUTARD, M.D., V.M.

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A CASTRATOR'S ERROR [*J. L. Percy, M.R.C.V.S.*].—The author was called to attend to a three-year's colt upon which an attempt at castration had been made by an unqualified man, who, it was thought, had amputated the penis instead of a testicle. The horse was found with the sheath considerably swollen and after being cast, the hand introduced into the wound felt the mutilated end of the penis with the urethra protruding. An opening was made through the sheath so as to prevent further infiltration of urine. But although the urethra protruded it was impossible to sew it to the skin until the swelling had subsided and further interference was postponed. After several days the horse was seen again. He was found in an improved condition and with four inches of the penis hanging through the wound at the sheath and pointing backwards and downwards. The horse could urinate by a rather small opening at the urethra and soiled his hocks terribly. Operation to relieve this condition was suggested, but the owner declined it, and the horse, twelve months after, was reported doing his work regularly and well. —(*Veter. Journ.*)

ADENO-CARCINOMATA OF THE LUNGS WITH SECONDARY GROWTHS IN A COW [*J. A. Gilruth, M.R.C.V.S.*].—Record of the post mortem of a cow which was destroyed after an undiagnosed state of sickness. The carcass was emaciated. The lungs showed no growth externally, but the left had a large swelling. A dilated bronchia being opened, a neoplasm became visible. It had a circumscribed periphery, was ovoid in shape, fairly dense and fleshy in consistency. The cut surface was yellowish with irregular fibrous bands and here and there areas

of degeneration. Scattered through the lungs they were smaller spots, probably secondary. The mediastinal glands were enlarged and on section very similar to the aspect of the neoplasm of the lungs. The kidneys were also affected. One of those organs was more diseased than the other. They contained nodules similar to those of the chest. The cancerous nature of those growths was made out by microscopic examination.—(*Veter. Journ.*)

AN INTERESTING SPLEEN, THE RESULT OF STRANGLES [*John Varney, M.R.C.V.S.*].—A hunter gelding had strangles. The disease ran its normal course but was particularly remarkable by the great amount of suppuration that came out of the abscesses. For several weeks, the manger, rack and boards of the stall had to be cleaned off and disinfected three times a day. After a long period of sickness and of depravation by the abscesses, the animal seemed to enter into convalescence, but yet remained delicate, ailing and in poor condition. The animal had never manifested any trouble of the pulmonary apparatus and fears of an abdominal collection of pus was entertained, although nothing seemed to call the attention in that direction. Careful watching, however, revealed "that the animal was often lifting his legs, one and then the other, towards his abdomen, with a corresponding twitching movement of the tail, and then throwing his head up with a groan and deep sigh. He often laid down; had no trouble about his bowels or kidneys." He finally died without a struggle. At the post mortem the spleen was found enormously thickened, enlarged, weighing thirty-seven pounds and adherent to the abdominal walls, diaphragm and stomach. There were strangles abscesses between the spleen and stomach. There was one also in the front part of the thorax. The lungs were consolidated in some places.—(*Ibidem.*)

AN INTERESTING MONORCHID [*Prof. F. Hobday, F.R.C.V.S.*].—Two-year old chestnut horse is presented as one of three cryptorchids for operation. He presents no evidence or has history of previous attempts at castration. The left testicle is present and removed. The right cannot be found, but instead a gradual merging of the end of a rudimentary cord into the lining of the peritoneum of the pelvis and no testicle. The wound is closed and the animal left to rise. Several hours after he is found with violent colic, the sutures have given way and



the bowels hanging down as far as the hocks. This condition is attended to at once, but peritonitis soon sets in and the horse dies. Post mortem: Complete absence of testicle, no evidence that one had ever existed, spermatic cord traceable and merging into the pelvic peritoneum. There were also extensive lesions of peritonitis.—(*Veter. Journ.*)

OXYGEN GAS IN THE TREATMENT OF PNEUMONIA [*Oscar Stimson, M.R.C.V.S.*].—Having a bad case of pneumonia in hand and being very desirous to do all he could to save him, the author decided to try oxygen inhalations. A cylinder of gas was obtained and a rubber tube with a glass funnel fitted on it. "The funnel was directed to the horse's nostrils, the regulating tap turned on so as to give a small but steady stream of gas and then the pipe was alternatively pinched and released as the horse expired and inspired. The flow was kept up for ten minutes and repeated after half an hour intervals. The result was not favorable as the animal died. But the effects were worth noticing." The respirations were, to commence with, seventy-five per minute, but became slower and easier in a few seconds and fell to sixty-two per minute, until the oxygen was stopped. Each administration showed a like result and gave a great deal of ease to the patient. The author says that he will use oxygen again in all respiratory difficulty he may have a chance to meet with.—(*Vet. News.*)

TETANUS IN A PIG [*James Forbes, M.R.C.V.S.*].—This young animal presented marked tetanus symptoms: Rigidity of the muscles, clenched jaws, labored breathing, retracted membrana nictitans, tail curled tightly over the back and ears drawn towards the median line. He had been castrated several weeks previous. For treatment, the wounds of castration were well washed with antiseptic solution and painted with pure tincture of iodine. Twenty grains of sulphate of magnesia with one minim of carbolic acid were injected in one-half an ounce of boiled water twice a day. After each injection some relief took place and the animal was able to stand, walk and drink. In about one week he had improved so much as to be able to take more solid food. Gradually the number of injections were reduced, and sulphur added to his food. However, the stiffness of the hind legs never left him entirely. The pig died after two weeks of treatment.—(*Veter. Record.*)

**BACELLI'S TREATMENT OF TETANUS** [*Wm. Collinson, M. R.C.V.S.*].—Following castration, after five weeks from operation, this one-year-old nag colt was sick for four days, during which he received one drachm of solution of carbolic acid, ten per cent., every two hours. He had, however, showed perhaps a little less nervousness in the last two days. He died at night in slings. Every place where an injection was made left considerable swelling.—(*Veter. Record.*)

**FRACTURE OF THE DENTATA—UNUSUAL CASE** [*H. Taylor, F.R.C.V.S.*].—This mare was sent to a horse-breaker and as she was rather hot tempered and had a decided will of her own, she resented any undue treatment. She was tied up as usual and suddenly one of the grooms heard one of the horses struggling. She was found lying on the ground. The halter shank was tight and instead of passing direct from the head collar to the place of fastening, it passed from the former up towards the ears, over the poll and from thence to the place where it was fixed. The mare had hung back on the halter and cast herself. After being relieved, not without difficulty, the animal made no attempt to get up. She died in twenty minutes. The dentata was found fractured into seven pieces. The neural canal was full of blood.—(*Ibidem.*)

**NORMAL PARTURITION AFTER EVERSION OF THE UTERUS** [*Same Author.*].—After a cow has had eversion of the uterus, generally no other occasion of another similar accident is given to her and she is fattened for the butcher. The author relates three cases which show that it does not follow that the succeeding calving will necessarily be followed by a repetition of the eversion. In two the uterus was everted in full and more or less swollen. In the third the eversion was smaller. In all three the succeeding calving was perfectly normal.—(*Ibidem.*)

**RUPTURE OF THE ANTERIOR MESENTERIC ARTERY BY STRONGYLUS ARMATUS** [*G. W. Townsend, F.R.C.V.S.*].—Nine-months-old thoroughbred has been very thin and unthrifty in appearance for several weeks. His case is hopeless. He was in a state of collapse with pulse small, quick and weak. The respiration accelerated, the extremities cold, the temperature normal, the mucous membranes were pale and the animal walked staggering. Intestinal parasites were diagnosed. The colt died

the next day. In the abdomen in the upper part and imprisoned with the intestinal contents, there was a big clot of blood. Rupture of a large blood vessel was evident. The clot was carefully removed and a rupture of a verminous aneurism, near the origin of the anterior mesenteric artery was exposed. The walls of the aneurism were thick and in the cavity were several specimens of *Strongylus Armatus*.—(*Veter. Record*.)

RUPTURE OF THE FLOATING COLON WITH ONE OF THE STOMACH [H. J. B. Eve, M.R.C.V.S.].—Case of an aged roan gelding which was taken with violent abdominal pains from which he died after being diagnosed as a case of engorgement of the stomach with gastric tympanitis probably complicated by rupture or twist. Post mortem confirmed the diagnosis. The symptoms presented were: Very acute abdominal pains; anxious expression of countenance; pulse quick, wiry, feeble and running down; visible mucus highly injected; respirations accelerated; temperature sub-normal; body covered with cold sweats; ears and legs cold; frequent tremors of the neck and fore limbs; great prostration; constant pawing with the fore feet; severe tympanitis; constipation. Frequent arching of the neck and attempts at vomiting. Towards the end spumous discharge from the nostrils.—(*Ibidem*.)

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## FRENCH REVIEW.

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By Prof. A. LIAUTARD, M.D., V.M.

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INTOXICATION BY CAFFEINE IN LARGE DOSES IN A DOG—RECOVERY WITH CHLORAL [L. Giraudet, *Army Veterinarian*].—A dog weighing between twenty and twenty-five kilogs., having a bad attack of distemper with broncho-pneumonia and pleuritic manifestations, was submitted to rational treatment, and as stimulant and diuretic, was prescribed to have one-third of a tablespoonful three times a day of a solution of caffeine made to contain 50 centigrammes of caffeine in a tablespoonful or a little over 15 centigrammes at each dose; certainly a small dose, taking into consideration the weight of the dog. Through some misunderstanding the dog received three tablespoonfuls every day. Three or four days after, as the animal was about

to die, the writer was called again and, on account of his condition and the symptoms presented (great dyspnea, spasmodic contracture of the jaws, labial breathing, paraplegia and clonic contractions of the paws), the owner wished him to be destroyed. To do so 10 grammes of chloral were given per mouth in concentrated solution. After three-quarters of an hour, the dog woke up, came out of his bed, walked quite strong and drank some milk. The bad symptoms of caffeine were all gone. Chloral had evident antitoxic effects against caffeine.—(*Bullet. Soc. Scient. Veter., Lyon.*)

EPITHELIAL CANCER OF THE KIDNEY GENERALIZED TO THE LUNGS IN HORSES [*Dr. Antonio Maja*].—In one case it was a fourteen-year-old mare, which was under treatment for wounds of the mouth and left nostril, which were accompanied with frequent and somewhat abundant hemorrhages. To lay aside all suspicion of glanders the animal was malleined, but with negative results. The animal was very anemic and ultimately died. At the post mortem there was found hemorrhage of the duodenum, the left kidney was much hypertrophied and deformed by the presence of a tumor which involved half of the renal structure. It was irregular in form, lobulated, and composed of easily torn tissue. The renal lymphatic glands were also affected. In the lungs there existed also a small metastatic nucleus having the same character as that of the renal tumor.

In the second case it was from a horse which had had several attacks of colic and died in one of them. At the post mortem, there was found a double renal neoplasm with pulmonary generalization. The left kidney weighed five kilogs. and seven hundred grammes. It contained a tumor similar to that of the preceding case. In the right kidney the lesions were less developed, but similar in nature. The microscopic examination made by the author revealed that the tumors were primitive epithelioma.—(*Bullet. Soc. Centrale.*)

PLEURITIC MELANOSIS—FATAL CARDIAC SYNCOPÉ [*Mr. C. Cuny*].—Gray Percheron mare, seven years of age, had always done good service. One day returning from work she is reported dull, breathing with difficulty, and she has been obliged to stop several times while in harness. She has refused eating hay for a few days. Seen immediately by the author, who was present, the mare shows severe dyspnœa, the number of respira-

tions being very difficult to count, as they were probably more than a hundred to the minute. There is no roaring. The conjunctivæ are very congested and the superficial veins largely dilated. Temperature is  $39.7^{\circ}$ . After a while the dyspnœa subsided some and yet the respirations remained very high. Auscultation indicates that breathing is normal all over the chest. The pulse is irregular, small and about 150 a minute. It is also intermittent. Exploration of the heart gives dull sound and corresponds in its irregularities to those of the pulse. An infectious disease of the respiratory apparatus in its incubative stage is suspected and expectant treatment prescribed: general friction with mustard, digitalis powder and nitrate of potash internally. Carefully watched, the animal seems more comfortable after a little time, but all of a sudden she drops down and dies.

*Post Mortem.*—The lesions were all located in the thorax, where numerous melanotic tumors were exposed. In large number, isolated, varying in size between that of a pea to the size of a hazelnut, irregularly disseminated all over the parietal and visceral pleura, they were found on the ribs, diaphragm and posterior mediastinum. Round the heart they formed big grapes, surrounding the cardiac muscle and covering the auricles and large blood vessels. At the entrance of the chest there was a compact blockade of tumors which had destroyed the anterior mediastinum and surrounded the blood vessels and nerves. There were no traces of melanosis in the pericardium or pulmonary structure. Under each shoulder there was a small melanotic deposit.—(*Journ. de Zootech.*)

**TUMOR OF THE NECK OF THE UTERUS IN A BITCH** [*Mr. L. Auger*].—This animal was four years old and for several months has had a bloody discharge from the vulva; she is otherwise in splendid condition. Vaginal exploration reveals nothing particular except that the fingers introduced are brought out covered with muco-bloody discharge. Abdominal manipulation gives the sensation of a large hard cylindrical and elongated body extending from the front of the pubis to inside the pelvis. Examination of the vagina made with the speculum permits the detection of a round mammilated mass protruding in the vagina. It is a neoplasm of the uterine neck or its surroundings, which has to be removed either by hysterotomy or abdominal hysterectomy. The dog is anæsthetized and the regions to be operated on are shaved and aseptized. Laparatomy is performed and the



enlarged body of the uterus appears, containing a hard mass, which is engaged in the pelvic cavity parallel to the rectum. On this account hysterectomy is not possible as no ligature can be applied far back of the tumor, which extends into the vagina. Hysterotomy is then performed. The uterus is open, the tumor is found fixed by its center on the left side of the womb near the neck. It is carefully drawn and pulled out and a ligature is applied on its base. Resection is performed above. But in so doing a portion of the walls of the uterus has been cut also and for fear of complications, hysterectomy had to be performed in the usual way. Dressing of the peritoneum, abdomen closed, skin sawed up and dry dressing applied, concluded the entire proceedings. Everything went on very well, for the first two days when the dog pulled away the dressing, the intestines hang from the abdomen by the tearing of the sutures. Death followed. The tumor measured 10 centimeters in length, from 4 to 5 in diameter. It weighed 150 grammes. It was a cystic fibromyxoma.—(*Journal de Zootech.*)

EVENTRATION AND WOUND OF THE RUMEN—RECOVERY [*Mr. A. Sarreau*].—A herd of cattle is coming down the mountains. One of them, a five-year-old cow, is pushed by another and falls into a precipice, where she remains empaled on the stump of a tree. Relieved from her position, she lays on the right side, with the left abdominal walls torn, skin and muscles from the point of the ilium to the posterior border of the last rib. The edges of the wound are bleeding and soiled with food. Careful examination reveals a perforation of the rumen 8 centimeters long and 5 wide. On the posterior border of this there is a portion of tissue torn and bruised. Food has dropped in the peritoneal cavity. The treatment was difficult to apply on account of the circumstances and location. The abdominal walls were covered with fenestrated cloth dipped in sublimate solution. The peritoneum was cleaned as well as possible with boiled salted water and the bruised and torn tissue were removed. The edges of the wound of the rumen were brought near those of the skin with the rumen sutured with big thread disinfected in boiled water; the muscles were sewed up and finally the skin. The whole was protected with an iodoform dressing. A pint of hot sugared wine was given to the cow, which was then slowly taken home. Seen a month after she was found in perfect health, fattening fast, and none the worse for the ordeal she had gone through.—(*Prog. Veter.*)



## BELGIAN REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

**RUPTURE OF THE AORTA** [*C. Verlinde*].—This is the post mortem of an old horse that was found in the morning dead in his stall. On opening the cadaver, the abdominal organs were found very pale. The thoracic cavity was full of blood clots, red, easily broken up in some places, white and very hard in others. Among them, the lungs, pale and retracted, are reduced in size. The pericardium has a large opening on a level with its insertion on the aortic trunk. It is full of clotted blood, and at first sight the heart appears as greatly hypertrophied, but when the blood is washed off, it is seen with its normal size and free from alterations. The primitive aorta has a transversal rupture at its origin on the free border of the sigmoid valves. This rupture occupies the convex or anterior part of the vessel, begins exactly at the level with the left coronary artery, runs forward, then to the right in following the free border of the sigmoid valve to end three centimeters near the insertion of the right coronary artery. The visceral pericardium is torn, covered with hemorrhagic spots. The tissue of the aorta was normal. The large thoracic blood vessels were filled with cylindrical clots, fibrinous and hard.—(*Bulle. Mede. Veter. Pratiq. Malines.*)

**LACERATION OF THE DIAPHRAGM** [*Same Author*].—Eight-year-old saddle horse reared suddenly and falls backward. He dies almost immediately. At the autopsy there was found on the line of separation of the phrenic center and muscular portion of the diaphragm on the left side, a large laceration running from upwards to downwards and involving the entire structure of the muscle. The diaphragmatic curvature of the large colon has passed through the opening and is pushing under, the left lung and the heart which pressed upwards and forwards are squeezed against the superior wall of the thoracic walls. Between the colon and the right lung there were the stomach, liver and spleen pressing the lungs against the costal walls.—(*Ibidem.*)

**A DOUBLE RIGHT INFERIOR TUSK** [*Same Author*].—Mentioned in the jackass, this abnormality is comparatively rare.

A seven-year-old horse, at times was observed bleeding from the mouth and had some difficulty in chewing his food. With the mouth widely opened with a speculum the tongue, being pulled out, is noticed with its inferior face on the right side literally covered with wounds irregularly parallel and deep, some cicatrized, or partly so and others bleeding. On a level with the second right lower molar, a tooth is implanted at right angles in the maxillary branch. It has the shape of a tusk and is very sharp. It is readily extracted with forceps and the trouble ceased at once.—(*Ibidem.*)

GENERALIZED SARCOMATOSIS IN A COW FOLLOWING A PAROTID SARCOMA [*H. R. Bredo*].—A cow had, on the right parotid near the thick portion of the posterior border of the inferior maxillary, a rather hard tumor as big as a man's fist. Adherent to the skin, it has an ulceration with a fistula running into a cavity from which, by pressure, is squeezed out sanious fluid with fetid gangrenous odor and containing soft debris mixed with small calcareous concretions. This neoplasm has grown slowly and as the condition of the animal is getting bad she is destroyed. At the autopsy, besides the parotid tumor, lesions of generalization were found. The lungs contained numerous lesions of various aspect and size on the superficies and in the thickness of the pulmonary lobes. The bronchial glands were diseased. The heart itself was involved, and some lesions similar to those of the lungs were found in its structure. The liver, pancreas, kidneys were also filled with similar tumors and presenting the same characteristics and appearance as the neoplasm of the parotid. The rumen, omentum, small and large intestines, were similarly invaded. The spleen and other organs were free from any apparent lesions.—(*Ibidem.*)

SYMPTOMS AND DIAGNOSIS OF COLICS PAR INVAGINATION IN BOVINES [*Ch. Tyvaert*].—Diagnosis: The symptoms given by the author are as follows—Violent colic lasting from six to twelve hours and followed by deceiving quietness; anorexia and arrest of rumination; tendency to assume position by which the fore quarters will stand higher than the hind ones; stretching of the vertebral column and forming an arch with concavity looking upwards; and dejections mucilaginous and almost always bloody. These manifestations are *positive* for a diagnosis of invagination, even if rectal examination remains negative. Dif-

ferential Diagnosis—In colic accompanying torsion of the uterus the animal does not assume the position of lower hind quarters; he constantly shakes his tail, micturates often, the lips of the vulva and the clitoris are the seat of continued contractions, vaginal exploration revealed the twisting. In very recent *traumatic pericarditis*, the respiration is accelerated, and moaning, pressure on the withers is very painful; the animal strikes with his fore feet either the ground or the sternal region. The cardiac beatings become less and less audible. There is a regurgitating noise and increased dullness over the heart. In *bacteridian anthrax*, colics are duller, and the animal does not assume the position met in invagination. Often blood escapes from the nostrils, mouth or anus. Fever is always very high and death occurs rapidly.—(*Annales de Bruxelles.*)

A FEW remarks picked up at random from thousands of letters received from REVIEW readers:

DR. P. H. BROWING, San Jose, Cal., says: "Enclosed find check for \$3.00 for which please renew my subscription for the REVIEW, the best friend of the veterinarian."

DR. J. F. BARNES, of Toledo, Ohio, says: "I can assure you I appreciate your journal very much and find it a great help to me in a professional way."

J. H. WEBSTER, D.V.S., San Francisco, says: "Enclosed please find check for \$3.00 for REVIEW for one year. It improves with age; keep the good work on."

DR. A. J. SAVAGE, of Colorado Springs, Colo., says: "Since it is essential to pay for the necessities of life I take pleasure in sending you check for three dollars to insure your monthly visit for another year."

THE following from Dr. Harry Norris, Felicity, O.: "Enclosed find post office money order for \$3.00, for which please extend my subscription for REVIEW another year. The information is well worth the money."

DR. W. N. ARMSTRONG, Concord, Mich., says: "Enclosed find \$3.00 for A. V. REVIEW. I forgot to remit earlier and find it impossible to get along without the reading matter it contains."

## BIBLIOGRAPHY.

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- A TEXT BOOK ON DISEASE PRODUCING MICRO-ORGANISMS. Especially intended for the use of Veterinary Students and Practitioners. By Maximilian Herzog, M.D., Professor of Pathology and Bacteriology in the Chicago Veterinary College; Pathologist to the German and the Alexian Brothers' Hospitals of Chicago; late Pathologist in the Bureau of Science, Manila, P. I., etc. Octavo about 650 pages, with 214 engravings and 14 colored plates. Cloth \$4.75 net. Lea & Febiger, Publishers, Philadelphia and New York, 1910.

This work, coming from the pen of a recognized authority, such as its author, whose several professional connections, medical and veterinary, have given him ample opportunity to follow his studies, will be welcomed by the veterinary profession of America and other English-speaking countries; the first of its kind in English to cover the entire field of pathogenic micro-organisms from the standpoint of the veterinary student and practitioner. Chapter I. is in the form of an introductory historical review, dealing with the origin of the microscope and the wonderful advances that followed in its train. Chapter II. deals with organisms, saprophytes, parasites and general remarks on disease-producing micro-organisms. Chapter III. defines bacteria and their position among organisms, types, etc., with illustrations. Among others, glanders bacillus, the bacillus of bubonic plague, anthrax and Asiatic cholera. Chapter IV. is on the biology of bacteria, temperature limits, nutrition, the reaction of the medium in which they grow, etc. Chapter V. deals with the occurrence of pathogenic bacteria in nature and routes of entrance in infection. Chapter VI. studies infection, phagocytosis and opsonins, going fully into protective agencies and lessening of virulence. This chapter includes an illustration of an opsonic incubator and opsonizing pipette. And so through the entire work in his thorough manner, the author deals in the succeeding chapters with antibodies, beautifully illustrating Ehrlich's side-chain theory and the Wassermann test; the methods of observing bacteria, the use of the microscope and acces-

sories, culture media and their sterilization, identification of bacteria, pyogenic bacteria in domestic animals, with illustrations of lip and leg disease (*Bacillus necrophorus*) in sheep, a paragraph on the bacillus of dog typhus; and finally getting into practical application, considerable space is devoted to vaccine therapy and protective inoculation, pathogenic bacteria in milk, cattle diseases transmissible through milk and bacteria in butter and cheese making. A chapter is devoted to simple chemical manipulations, normal solutions and indicators required in laboratory work in bacteriology. In short, it is a work that no veterinarian can afford be without at this time when biology plays such an important part in the treatment of diseases, and the teacher will find it peculiarly adaptable, as each chapter is followed by a list of questions pertaining to the subjects treated in it.

THE REVIEW office was recently honored by a visit from R. C. Longfellow, M.D., of the Toledo Clinical Laboratories. This broadminded member of our sister profession is Pathologist and Bacteriologist to the North Western Ohio Veterinary Medical Association, and has demonstrated his love for work rather than mere honor by having, since his connection with that organization, studied urine from azoturia patients, examined tissue specimens from clinical cases for diagnosis, prepared autogenous vaccines for all pus cases, infections, nasal secretions, etc. He has examined heads of animals for rabies, and given the protective treatment to exposed individuals. In fact, Dr. Longfellow's services along all lines are open to the veterinary practitioners on the same basis as to his brothers in the medical profession. He refers to the veterinarians as his "veterinary brothers," in whose hands, the doctor says, he has seen splendid results from the use of autogenous and stock vaccines in pus cases, and holds that all biologic remedies have a useful field in veterinary medicine, but the same technique, care and precision must be exercised in their preparation as when made for use on man. Dr. Longfellow delights in the acquaintance of the progressive man, and it matters not to him which branch of medicine he belongs to. He is the veterinarian's true friend, not only in Ohio, but everywhere.



## SOCIETY MEETINGS.

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### IOWA VETERINARY ASSOCIATION.

The Twenty-second Annual Meeting was called to order at Des Moines, Iowa, January 15, 1910, at 2 p. m., President Talbot presiding.

Address of welcome by Mayor A. J. Mathis. Response, State Veterinarian P. O. Koto. A vote of thanks was extended Mayor Mathis.

#### PRESIDENT TALBOT'S ADDRESS.

Brother Members of the Association—It is with extreme pleasure that I greet you to this, the twenty-second annual meeting of the Iowa State Veterinary Medical Association.

On behalf of the entertainment committee and our local veterinarians I welcome you to our city and trust that your three-days' visit with us may be as pleasant as the pleasure we experience in entertaining you.

Our local committee has been untiring and unselfish in its efforts to procure for you an interesting entertainment and an instructive clinic and has spared no pains to make this gathering both pleasant and profitable. However, if we have failed to meet your expectations, remember that we have tried and that no one will regret the failure more than the local entertainment committee.

The evidence of your friendship and good will which I received one year ago at Ft. Dodge by being elected your president, is only another gem in my book of memory, a gem which stands out bright and clear as indicating your trust and esteem and should my future professional career be barren of further recompense I would still deem myself amply repaid for any service which I may have been able to render in the past.

I wish to express my heartfelt appreciation and gratitude for your loyal support and to assure you that I only accepted this office with the realization that it is not the official which makes the association, but that it is the association which makes the official possible and which fits its members for that position.



Knowing full well that it requires not only your attendance, but the hearty co-operation of each and every member to enable the Iowa State Veterinary Medical Association to attain its present rank as one of the foremost of the state associations, I yet feel that a great deal must be accomplished before we have reached the limit of our sphere of usefulness. First, let us consider that Iowa has over 400 graduated veterinarians and that less than fifty per cent. of these are members of this association; and then allow me to suggest that each member present appoint himself a committee of one to secure at least one new member during the coming year and that he send his name to our secretary before the next meeting. It is gratifying to know that when once a veterinarian joins our association, he is generally ours for all time and so nearly has this become a rule with our membership that we can say with considerable truth: "Once a member, always a member." In fact I can hardly conceive of a veterinarian attending one of our meetings, but that he should return to his duties encouraged and better equipped for another year of service and feeling that his time and money had been well spent. Remember that new veterinarians are constantly coming into our state; men who can be of use to us and to their community as members of this association, so let us consider it not only a duty, but a privilege to ask them to join us and to help us in our effort toward the betterment of their own condition as well as that of the public which they serve.

While the history of our association up to the present time has been largely a program of education, let me suggest that this program be broadened so as to include the education of our membership to meet the legislative problems which now confront us. Let me illustrate by calling attention to the city in which we are now assembled. Des Moines, the capital city of Iowa, and its metropolis, has enjoyed a wonderful growth during the past two years. Our adoption of the commission form of government has attracted the attention of practically the entire country and just as our national government was once the subject of controversy and doubt among the older governments of Europe, so has the commission form of government and its workings been watched with a great deal of interest by the older municipalities of this country, and I may add that just as our national government proved its worth and found imitators among the older nations, so has the commission form of government proved its worth, and under the able leader-

ship of our worthy mayor and the men who have been associated with him in this work, our municipal affairs have been so administered that the growth of our city has been third among all of the cities of the country and for the month of December we led the entire country in the percentage of our improvements.

I have mentioned these facts, however, only for the purpose of emphasizing a crying need which has not been supplied by our municipal government, a precaution the necessity of which younger and smaller cities have seen the need, but which seems to have been passed unnoticed by our city commissioners in the rush of larger and more apparent necessities. I refer to an ordinance providing for the rigid inspection and testing of the dairy herds from which the city is supplied.

The little city of Colfax, so close that it may almost be considered one of our suburbs, has seen the necessity for such action and has an ordinance requiring the municipal inspection of all dairy herds which supply the milk sold in that city, and yet the largest and most progressive of the cities of Iowa, the capital of the state and the city to which others should look for pioneer legislation, is strangely backward in this most necessary of all legislation, the protection of the health of its citizens.

I do not wish to advocate the profession of a politician for each of you, but I do feel it my duty to urge each of you to make the most of his opportunities to cultivate the acquaintance of his senators and representatives, to the end that he may be able to cast his influence upon the side of right when this great question comes up for final settlement, as it must in the near future.

Our state veterinary law and the changes it has wrought for the betterment of the conditions of the veterinarian, are now matters of history. This spring marks the tenth anniversary of the passage of that law, ten years which have seen the widely scattered remnants drawn together in a vast state brotherhood, which have seen a diversity of selfish interests sacrificed for the common good, until even those who were at first the enemies of the law have finally recognized its beneficent effects and are one in upholding it. The country at large seems just awakening to the fact that to the farmer and stock-raiser of the middle and western states it must look for its future food supply. Thousands of dollars are annually being spent to bring into this and surrounding states some of the finest stock that the world has ever

seen and it is to you, my brother practitioners, that the stock-owner must look when disease threatens his herd and he sees the savings of years being swept away. Let us not be remiss in our duty to those who place their trust and their fortune in our hands. Let us ever be keenly alert to the march of events, keeping thoroughly abreast of the times, reaching out for that which is good in the new, but never at the expense of that which was better in the old. In fact that conservative policy which is contained in these old lines still retain their potency and truth:

"Be not the first by whom the new is tried;  
Nor yet the last to lay the old aside."

In closing let me make a plea for a more tolerant spirit between the members of our profession. Let the old jealousies which in the past have set our work at naught be forgotten, and, remembering that "in union there is strength," let us present a solid front to those who oppose the great legislative reforms which we know are vital to the health of the community.

Reading of the minutes was dispensed with. Instead they were accepted as published in the April number of the *AMERICAN VETERINARY REVIEW*. Report of secretary was read and considerable time taken to discuss that part relative to time of next meeting. Finally a motion was made and carried that we have a clinic and that the time and place for the meeting be left to the Executive Committee, only that it be held early in January.

The resignation of T. A. Shipley was accepted, and Dr. Shipley elected to associate membership.

Report of the Committee on Sanitation read and discussed.

Dr. W. B. Niles gave a talk on "Hog Cholera Serum," and a demonstration of injection of serum, after which he answered a great many questions relative to the results obtained from the serum.

Meeting called to order 8.15 p. m.

Dr. D. M. Campbell, of Topeka, Kansas, editor of the *Missouri Valley Veterinary Bulletin*, read a paper on the use of Bacterins, which was very freely discussed.

Dr. Campbell was elected to associate membership.

Dr. A. G. Field (M.D.) being present, made a short talk and said some very nice things about the veterinary profession and the wonderful advances it has made in the last few years. Prof. L. H. Pammel being present, gave a talk on Fungi, which was quite freely discussed by a number, Dr. Stange telling of

some cases of forage poisoning where the mould was found growing in the mucosa and sub-mucosa of the intestine. A vote of thanks was extended to Prof. Pammel. Dr. F. H. Hollingsworth reported a case of glanders.

The reliability of the mallein test as well as its curative effects, if any, were quite freely discussed; it was found that there were many men of many minds amongst those present.

Second day. Meeting called to order at 10 a. m.

Dr. Stange, chairman Committee Disease and Treatment, rendered his report.\*

Dr. G. A. Scott reported a case of Alopecia affecting a livery horse doing ordinary work of his kind; hair is now growing in again nicely.

Dr. W. E. Miller gave a report of an outbreak of anthrax.

Dr. N. M. Repp reported a case of a suckling colt running at pasture on a creek bottom which became mired in a bayou on his side; in getting out tail was pulled off up to sacrum, muscles badly injured and bled very freely. Feces lodged for a long time owing to the rectum falling forward, the superior attachments being torn away; final recovery, except mutilation.

Treasurer's report was read and reported as correct by the Auditing Committee.

Dr. W. A. Heck reported cases of infection in foals, abscesses in gluteal region, later shifting to region of rectum and along the tail; slow to heal; usually commence with lameness in front; constipation nearly always present to quite an extent; all were weanling foals. Some cases live only a week, others drag along for nearly a month, no navel infection. Supposition is that it is due to parasitic infection. Some cases recover without abscess formation when given internal antiseptics early.

#### REPORT OF COMMITTEE ON RESOLUTIONS.

We, the Committee on Resolutions, beg leave to report as follows:

Resolved, It is with deep regret that we chronicle the loss of one of our valued and active members occasioned by the death of Dr. T. D. Hulme, of Commerce, Iowa. Be it further

Resolved, That a copy of this resolution be spread upon the records of this Association.

Resolved, Whereas an all-wise Providence has removed from our midst, Dr. Milikin Stalker, a one-time active and honored member of our association, and one who always took a deep

\* Will appear in January issue of REVIEW

interest in the advancement of our profession. Therefore, be it

Resolved, That in the death of Dr. Stalker, we have lost a valued friend and co-worker. Be it furthermore

Resolved, That we deeply regret this loss and that a copy of these resolutions be spread upon the minutes of this association.

Resolved, That this association unanimously endorse one of its members, Mr. George Judisch, as delegate to the United States Pharmacopœal Convention. And be it further

Resolved, That it is the opinion of this association that the profession should be represented on the board appointed to revise the United States Pharmacopœa.

Resolved, That in the interest of the public health, we believe that ordinances in every municipality in the state should be passed to insure the healthfulness and wholesomeness of milk and meat food products.

Resolved, That in order to prevent the spread of the contagion of tuberculosis within the state, we recommend that all cattle sold for dairy or breeding purposes at public auction should be subjected to the tuberculin test by a qualified veterinarian, and a certificate of health be delivered to each purchaser.

Resolved, That Tuberculin is recognized as a reliable, diagnostic agent when properly used. Therefore, in order to prevent its fraudulent use, we recommend the enactment of a law requiring that a report of each and every sale of Tuberculin within the state, be made to the State Veterinarian within ten days from date of sale.

Resolved, That hereafter, the wives and sweethearts of the members of this Association be extended a cordial invitation to attend the annual banquet of this association.

Wednesday, 1.30 p. m., called to order, A. S. Brodie in the chair.

C. L. Wilhite reported on treatment of pneumonia, which was very freely discussed. George Judisch, Professor of Pharmacy, Iowa State College, gave a talk on pharmaceutical subjects, and resolutions were passed on some of the points suggested by Mr. Judisch. J. H. McLeod, "Control of Tuberculosis"; G. M. Walrod, "Tuberculosis in a Mare." These two cases were discussed together. Dr. Dyson, of Chicago, was called on for remarks on the subject of tuberculosis. He emphasized the necessity for local meat and milk inspection with compulsory slaughter of reactors. Motion by Dr. Koto that Committee on Resolutions be instructed to incorporate the request



that Mr. Judisch apply for representation by a veterinarian on the Board to revise the Pharmacopoeæ. Amended by Dr. Stange, that fifteen dollars be appropriated to help reimburse Mr. Judisch. Carried.

The secretary was instructed to cast the ballot of the Association for election to membership of the following gentlemen: A. C. Middleton, B. Fisher, C. E. Fuller, A. I. Kulp, E. C. Sheu-maker, J. M. Vernon, H. J. Hagerty, S. H. Johnson, L. E. Smith, E. E. Black, C. E. Blakely, C. L. Gamrath, G. E. McIntire, F. W. Larson, F. J. Kennedy, J. M. Nelson, J. F. Thomsen, J. E. Frank, A. N. Tyler, E. J. Higgins, A. S. Morris, P. Cain, Robert Mollance, L. Jennings, Robt. D. Wall, C. W. Ferguson, H. A. Alcorn, A. J. Abarr, C. E. Hunt; F. E. Brazie.

Dr. S. Beattie presented a case report, "Ovine Pneumonia." Dr. R. R. Dykstra gave a talk on "Some Anatomical Points of Practical Importance." This was an interesting talk to all practitioners.

Election of officers resulted as follows: President, F. J. Nieman, Marshalltown; First Vice-President, H. B. Treman, Lake City; Second Vice-President, G. M. Walrod, Storm Lake; Secretary-Treasurer, Hal C. Simpson, Denison; member of Executive Committee for full term three years, R. R. Dykstra; member of Executive Committee for one year, to fill vacancy caused by resignation of President Nieman, D. E. Baughman.

A banquet was held at The Savery, which was an innovation, none having been held for a great many years. Nearly seventy-five attended and all spent a very pleasant evening. Excellent singing was rendered by a quartet, of which Dr. J. I. Ginson of the local committee was a member.

Among the visitors present were: Professor R. Chittick, State Chemist; Phil Kell, editor of the *Spirit of the West*; Dr. D. M. Campbell, of the *Missouri Valley Bulletin*; Professor Pammel, of Ames, Iowa State College; Dr. O. A. Dyson, of Chicago, and Dr. Richard P. Lyman, Secretary of the A. V. M. A. Dr. S. H. Bauman (veterinarian), a member of the Legislature from Van Buren County, a Democrat elected by a large majority from a strong Republican district, responded when called upon by the toastmaster, Dr. S. Stewart. At a late hour we adjourned, agreeing to meet around the banquet table next year and to have the wives and sweethearts with us at that time.

Meeting called to order at 9.30. C. J. Heckard not being present, secretary read his report of a case. Discussed by a num-



ber with possibility of being Hæmorrhagic Septicæmia. Other suggestions were Blacklegoid falling out of injector or having so much vaseline around as to become encysted and never dissolving. Dr. R. P. Lyman was requested to outline the proper method of procedure in making a thorough tuberculin test. After which the subject of tuberculosis and tuberculin testing was discussed by a great many of those present. Report of the Committee on Resolutions was read and accepted. Report of the Committee on Legislation was read and accepted. Dr. R. P. Lyman and Dr. O. E. Dyson were elected to associate membership. Meeting adjourned to visit Dr. J. I. Gibson's hospital, where clinic was held. Owing to the inclement weather there was not a great deal accomplished along this line.

HAL C. SIMPSON, Secretary.

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#### TENNESSEE VETERINARY MEDICAL ASSOCIATION.

The second annual meeting of this association was held in Nashville, Tenn., November 3d and 4th, in the Assembly Hall of the Hotel Hermitage. The meeting was called to order by President Giltner at 10 a. m. Address of welcome by Hon. H. E. Howse, Mayor of Nashville. Response to address of welcome, Dr. G. B. Giltner, Murfreesboro, Tenn. President's address, by Dr. Giltner. Roll call, by Dr. A. C. Topmiller, secretary, Murfreesboro. Minutes of last meeting were read and unfinished business disposed of.

Reports of Executive, Legislation, Finance and Resolution Committees. The following resolution was offered by Dr. Geo. R. White, chairman Committee on Legislation, and accepted unanimously:

Be it resolved that the secretary in conjunction with the chairman of the Legislation Committee be instructed to secure an up-to-date list of the practitioners of veterinary medicine and surgery in Tennessee, and that expense be paid by the association. Be it further resolved that this association go on record as favoring the various recommendations in the president's address, and the report of the Committee on Legislation, and that we lend our united support to our Committee on Legislation in their efforts toward securing legislation.

Applications for membership.—Addam Elmore Robertson, M.D.V., Nashville, Tenn.; Chas. Wm. Wattam, 271 Court avenue, Memphis, Tenn.; H. H. Edwards, Lewisburg, Tenn., and Adolphus Wm. Waldron, Tullahoma, Tenn. The four applicants were admitted to membership in the association.

Election of officers for 1911 resulted as follows: President, Dr. Geo. R. White, Nashville; First Vice-President, A. O. Kennedy, Columbia; Second Vice-president, L. T. Lewis, Gallatin; Secretary, A. C. Topmiller, Murfreesboro; Treasurer, J. H. McMahon, Columbia.

12 m., adjournment for luncheon; 2 p m., association reassembles.

#### PAPERS AND DISCUSSIONS.

"Parturient Palsy," by Dr. A. E. Robertson, Nashville; "Eradication of Contagious and Infectious Diseases," by Dr. J. A. Kiernan, U. S. Veterinary Inspector in charge, Nashville; "Meat Inspection in Tennessee," by Dr. Willis B. Lincoln, Nashville; "Johne's Disease," by Dr. Joseph Plaskett, Nashville; "The Foot, Its Wounds and Treatment," by J. B. L. Terrell, Dresden; "Case Reports," by Dr. A. O. Kennedy, Columbia, and "The Forty-seventh Annual Meeting of the A. V. M. A.," Dr. G. R. White, Nashville.

After the installation of officers the following committees were appointed by President White: Executive Committee—F. R. Youree, chairman; Joseph Plaskett, W. L. Coplin. Legislation Committee—G. B. Giltner, chairman; Julius W. Scheibler, M. Jacob. Finance Committee—A. E. Robertson, chairman; H. H. Edwards, J. B. L. Terrell. Resolutions Committee—O. L. McMahon, chairman; J. B. Edwards, Frank B. Moore.

At 8.15 p. m. the members and visitors attended a theatre party as the guests of Drs. White and Plaskett.

#### SECOND DAY, NOVEMBER 4—CLINIC.

The clinic was held at the private infirmary of Drs. White and Plaskett, 24 Bridge avenue. The following operations were performed: Caudal myotomy, Dr. G. B. Giltner, Murfreesboro; X-ray demonstration, Dr. Jos. L. T aylor, Nashville; casting, Dr. J. B. Edwards, Fayetteville; simple abscess, Dr. O. L. McMahon, Columbia; eversion of uterus, Dr. Joseph Plaskett, Nashville; spaying bitch (Jacob operation), Dr. A. C. Topmiller, Murfreesboro; Johne's disease (clinic), Dr. Joseph Plaskett, Nashville;

bursatta (two cases), Dr. Jos. Plaskett, Nashville; spaying bitch, Dr. Geo. R. White, Nashville; removal of water bag, Dr. Geo. R. White, Nashville; castration four-year-old stallion, standing operation, Dr. Geo. R. White, Nashville; castration five-year-old stallion, standing operation, Dr. O. L. McMahon, Columbia; arytectomy, McKillip's operation, Dr. Geo. R. White, Nashville; pectoral fistula, Dr. G. B. Giltner, Murfreesboro; cunean tenotomy, Dr. G. B. Giltner, Murfreesboro; peroneal tenotomy, Dr. G. B. Giltner, Murfreesboro; trifacial neurectomy, Dr. Geo. R. White, Nashville; median neurectomy, Dr. A. C. Topmiller, Murfreesboro; demonstration of electrical power floating, Geo. R. White, Nashville; ligation of vena saphena major for bog spavin, Geo. R. White, Nashville.

The next meeting will be held in Columbia some time during the month of October.

A. C. TOPMILLER, Secretary.

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#### VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

The regular meeting was held in the lecture room of the New York-American Veterinary College on Wednesday evening, November 2, with the president, Dr. E. B. Ackerman, in the chair. There was a good attendance of members and visitors.

After some routine business had been transacted, Dr. J. F. De Vine, Chief Veterinarian of the New York State Department of Agriculture, addressed the association on "The Department of Agriculture and the Veterinary Profession." Dr. De Vine spoke of the recent legislation of interest to the veterinary profession, pertaining to the control of some of the infectious diseases, particularly glanders, tuberculosis and rabies. At the conclusion of the address many of the members availed themselves of the opportunity to question the speaker; and some matters pertaining to the subject, and not brought out by Dr. De Vine, were then explained by him.

Dr. Chas. S. Chase, then followed with a well-written and interesting paper on "Some Modern Methods in the Treatment of Disease." He spoke of the progress recently made in the treatment of infectious diseases, especially along the lines of preventive medicine, which he believed was only in its infancy.

Dr. Geo. H. Berns presented a large tumor, weighing several

pounds, which was successfully removed from the mammary gland of a sixteen-year-old mare. This tumor had a history of some eight years' growth.

Dr. Berns also reported on the case of a dog which died of acute enteritis, and an autopsy showed a large Haemorrhagic Infarction of the spleen. This spleen was shown to those present.

Dr. Gill moved that a vote of thanks be extended to Dr. De Vine for coming to address us, which was heartily seconded and carried.

Drs. Chase and Berns also received a vote of thanks for their excellent contributions to the programme.

Drs. Gill, Ellis and Blair were appointed a committee to draw up resolutions recommending the establishment of a Veterinary Bureau in the local health department. Meeting adjourned.

W. REID BLAIR, Secretary.

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#### MAINE VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of this association was held at the Elwood Hotel, Waterville, at 7.30 p. m., October 12, 1910. The meeting was called to order by President Joly, and roll call showed the following members to be present: Drs. Salley, Lord, Joly, F. E. Freeman, E. E. Russell, F. L. Russell, W. S. Mebane; H. L. Stevens, W. H. Lynch, W. L. West, A. L. Murch, C. T. French, C. H. McGillicuddy, C. F. Dwinal, C. W. Watson and C. L. Blakely.

The minutes of the July meeting were read and approved.

The report of the Legislative Committee was read and showed considerable work to be done during the coming legislature. The application of Dr. Crosby French, of Rockland, having been favorably reported upon by the executive committee, the doctor's name was balloted upon and he was declared unanimously elected a member and was escorted to the room by Drs. Freeman and West, and he signed the by-laws.

The Banquet Committee reported making good progress towards a banquet in January, with an entertainment that will be pleasing to all who attend.

Dr. I. L. Salley, of Skowhegan, read a paper entitled "Rheumatism." The subject was carefully looked into and the paper contained much food for consideration. Dr. Salley was voted the

thanks of the association for the masterful way in which he presented his paper. Discussion followed.

Dr. H. L. Steven, of Rockland, read a paper entitled "Retrospection and Prospection of the Veterinary Profession in Maine." Discussion followed, after which a vote of thanks was given the essayist.

Dr. A. Joly, Waterville, read a report on the milk supply of Waterville. Voted to meet in Augusta, January, 1911.

Meeting adjourned 11.30 p. m.

C. L. BLAKELY, Secretary.

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#### SOCIETY OF COMPARATIVE MEDICINE, NEW YORK STATE VETERINARY COLLEGE, CORNELL UNIVERSITY.

This society held its first meeting of the year on October 7th. This meeting was given over as a reception for the entering class. The freshmen were given an opportunity to sign the constitution and become members of the society. Thirty men availed themselves of this privilege. Songs were sung and refreshments served by members of the society.

The society met again on October 28. Four papers were read by members of the senior class. Each paper was discussed by the members and a number of valuable points in diagnosis and treatment were brought out.

C. P. FITCH, Cor. Secretary.

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CORRECTIONS.—Three typographical errors occurred in the November number, all in "fillers" on which we had no opportunity of passing after they were set up. On page 235 the compositors, finding the article a line too long, removed one which should have remained between the second from the bottom and the third from the bottom, and following the word "He," which now stands alone, should have read, "He graduated in the class of 1904 at the University of Pennsylvania," etc., etc. On page 203, in naming the officers of the Chicago Veterinary Society, E. L. Turtman should have been E. L. Quitman if printed according to the copy. On page 220, B. S. C. after James B. Paige was written B.Sc., and should have been so printed.



## NEWS AND ITEMS.

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JUST as we were closing our forms we received word from Secretary Marshall, of the A. V. M. A., that the dates fixed for the 1911 meeting at Toronto, are August 22, 23, 24 and 25.

DR. A. B. McCAPES was appointed Food and Dairy Inspector for Boulder, Colo. Boulder has just recently fallen in line and enacted an ordinance of this kind.

THE Veterinary Medical Association of New Jersey will hold its annual meeting at Trenton, January 12, 1911. Election of officers and an attractive program will be the features of the meeting.

DR. JAMES L. ROBERTSON, New York, who has been ailing since August, and very sick since the middle of September, has become sufficiently convalescent to make a trip to Ohio, where he hopes to recuperate in the country surroundings.

THE many friends of Dr. J. G. Rutherford, Veterinary Director General and Live Stock Commissioner of the Dominion of Canada, will be grieved to learn that he has been confined to his house under the doctor's care, through illness, practically ever since his return from the National Convention at San Francisco.

PRESIDENT GLOVER, of the A. V. M. A., has just completed the arduous task of making his appointments for 1910-11. In our November issue we printed the list of committee appointments, *except* the "special committees" which we have just received, together with the resident state secretaries, which we regret arrived just one day too late to be published in this issue. They will appear in the January number. In his letter of transmittal, President Glover stated that he had been in bed for three days, but did not mention whether it was due to the making of the formidable list of appointments he enclosed. However, he hoped to meet his turkey at Thanksgiving dinner next day.



## VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary
Alumni Ass'n, N. Y.-A. V. C.....	Aug. 22-25, 1911.	141 W. 54th St. Toronto, Can.	J. F. Carey, East Orange, N. J. C. J. Marshall, Philadelphia. Horace E. Rice, Little Rock.
Arkansas Veterinary Ass'n.....	1st and 3d Thur. of each month	Lec. Room, Laval Un'y, Mon.	J. P. A. Houde, Montreal.
Ass'n Médécalle Veterinaire Française "Laval".....	2d Fri. ea. mo.	Chicago.....	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., Chicago.....	3d Mon. ea. mo.	S. Omaha, Neb	E. J. Jackson, So. Omaha.
B. A. I. Vet. In. A., So. Omaha ..	.....	San Francisco.	J. J. Hogarty, Oakland.
California State V. M. Ass'n.....	.....	Ottawa .....	A. E. James, Ottawa.
Central Canada V. Ass'n.....	June and Nov.	Syracuse .....	W. B. Switzer, Oswego. .
Central N. Y. Vet. Med. Ass'n.....	2d Tues. ea. mo	Chicago .....	D. M. Campbell Chicago.
Chicago Veterinary Society.....	1st Tues. Feb. '11	Denver .....	M. J. Woodliffe, Denver.
Colorado State V. M. Ass'n.....	Dec. 21, 22, 1910.	Hartford. ....	B. K. Dow, Willimantic.
Connecticut V. M. Ass'n.....	Dec. 6, 7, 1910.	Atlanta.....	J. H. Taylor, Henrietta.
Genesee Valley V. M. Ass'n.....	Jan. 3, 4, 1911....	Chicago.....	P. F. Bahnsen, Americus
Georgia State V. M. A.....	Jan. 11, 12, 1911.	Centralia.....	Louis P. Cook, Cincinnati.
Hamilton Co. (Ohio) V. A.....	Jan. 3, 4, 5, 1911.	Indianapolis....	J. H. Crawford, Harvard.
Illinois State V. M. Ass'n.....	Jan. 10, 11, 1911.	Marshalltown.	F. Hockman, Louisville.
Illinois V. M. and Surg. A.....	.....	Topeka .....	E. M. Bronson, Indianapolis
Indiana Veterinary Association...	.....	Not decided ..	H. C. Simpson, Denison.
Iowa Veterinary Ass'n.....	.....	.....	B. Rogers, Manhattan.
Iowa State V. M. Ass'n.....	.....	.....	D. A. Platt, Lexington.
Kansas State V. M. Ass'n.....	.....	.....	E. H. Yunker, Phila.
Kentucky V. M. Ass'n.....	.....	.....	E. P. Flower, Baton Rouge.
Keystone V. M. Ass'n.....	.....	.....	C. L. Blakely, Augusta.
Louisiana State V. M. Ass'n.....	.....	.....	H. H. Counselman, Sec'y.
Maine Vet. Med. Ass'n.....	.....	.....	Wm. T. White, Newtonville.
Maryland State Vet. Society.....	.....	.....	Judson Black, Richmond.
Massachusetts Vet. Ass'n.....	.....	.....	G. Ed. Leech, Winona.
Michigan State V. M. Ass'n.....	.....	.....	J. C. Robert, Agricultural Col.
Minnesota State V. M. Ass'n.....	.....	.....	Hal. C. Simpson, Denison, Ia.
Mississippi State V. M. Ass'n.....	.....	.....	D. L. Luckey,
Missouri Valley V. Ass'n.....	.....	.....	W. S. Swank, Miles City.
Missouri Vet. Med. Ass'n.....	.....	.....	H. Jensen, Weeping Water.
Montana State V. M. A.....	.....	.....	H. J. Milks, Ithaca, N. Y.
Nebraska V. M. Ass'n.....	.....	.....	W. G. Chrisman, Raleigh.
New York S. V. M. Soc'y.....	.....	.....	C. H. Martin, Valley City.
North Carolina V. M. Ass'n.....	.....	.....	A. J. Kline, Wauseon.
North Dakota V. M. Ass'n.....	.....	.....	O. V. Brumley, Columbus.
North-Western Ohio V. M. A.....	.....	.....	F. F. Sheets, Van Wert, Ohio.
Ohio State V. M. Ass'n.....	.....	.....	R. A. Phillips, Oklahoma City
Ohio Soc. of Comparative Med..	.....	.....	C. H. Sweetapple, Toronto.
Oklahoma V. M. Ass'n.....	.....	.....	H. K. Berry, Paterson, N. J.
Ontario Vet. Ass'n.....	.....	.....	F. H. Schneider, Phila.
Passaic Co. V. M. Ass'n.....	.....	.....	Chas. G. Thomson, Manila.
Pennsylvania State V. M. A.....	.....	.....	Peter Hanson, Portland, Ore.
Philippine V. M. A.....	.....	.....	Gustave Boyer, Rigaud, P. Q.
Portland Vet. Med. Ass'n.....	.....	.....	J. S. Pollard, Providence
Province of Quebec V. M. A.....	.....	.....	.....
Rhode Island V. M. Ass'n.....	.....	.....	.....
St. Louis Soc. of Vet. Inspectors.	.....	.....	.....
Schnykill Valley V. M. A.....	.....	.....	.....
Soc. Vet. Alumni Univ. Penn.....	.....	.....	.....
South Dakota V. M. A.....	.....	.....	.....
Southern Auxiliary of California State V. M. Ass'n.....	.....	.....	.....
So. St. Joseph Ass'n of Vet. Insp..	.....	.....	.....
Tennessee Vet. Med. Ass'n.....	.....	.....	.....
Texas V. M. Ass'n.....	.....	.....	.....
Twin City V. M. Ass'n.....	.....	.....	.....
Vermont Vet. Med. Ass'n.....	.....	.....	.....
Veterinary Ass'n of Alberta.....	.....	.....	.....
Vet. Ass'n Dist. of Columbia.....	.....	.....	.....
Vet. Ass'n of Manitoba.....	.....	.....	.....
Vet. Med. Ass'n of N. J.....	.....	.....	.....
V. M. Ass'n, New York City.....	.....	.....	.....
Veterinary Practitioners' Club.....	.....	.....	.....
Virginia State V. M. Ass'n.....	.....	.....	.....
Washington State Col. V. M. A ..	.....	.....	.....
Washington State V. M. A.....	.....	.....	.....
Western Penn. V. M. Ass'n.....	.....	.....	.....
Wisconsin Soc. Vet. Grad .....	.....	.....	.....
York Co. (Pa.) V. M. A.....	.....	.....	.....

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SHARP AND SMITH'S SPECIAL OFFER on page 29 (advertising department) of this issue is attractive because of the quality of the goods offered. Quality is the watchword of that reliable house.

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DEMAND A DEFINITE GUARANTEE are the significant words at the heading of the West Disinfecting Co.'s advertisement on the inside of the back cover page of this issue of the REVIEW and they stand ready to make good.

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THE BUNTIN DRUG CO.'S PERFECTION HYPODERMIC SYRINGE, made entirely of metal is practically indestructible, and altogether one of the most satisfactory syringes available for the veterinarian. Their soluble hypodermic tablets have stood the test of time and are still in the front rank.

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BLAND'S BALLING GUN will save you time, trouble, vexation and probably a case of pneumonia some cold night by being able to administer a capsule without removing your overcoat. They are made in two sizes now; the size you have always had, and a larger size for the larger capsules which are conveniently used to administer liquid medicine. Illustrated on page 23 (advertising department).

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THE COMPOUND SILVER MIXTURE of the Carter-Luff Chemical Co., has proven itself a very useful and helpful compound in the treatment of bone lameness, and affords many opportunities for the successful treatment of horses in the early stages of spavins, ringbones and splints, while at work, that would otherwise run on to an advanced stage, and only be laid up for treatment *requiring* them to lay up, when they *can no longer work*; too late, in many instances, for results from *any* treatment.